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1. Stephens, V. C., *et al.*: J. Am. Pharm. A. (Scient. Ed.), *48*:620, 1959.
2. Salitsky, S., *et al.*: Antibiotics Annual, p. 893, 1959-1960.
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Your Questions answered

Readers may send questions from their own practice or other medical problems which will be answered by qualified consultants. Replies are forwarded by mail immediately and selected questions and answers are published each month in this section.

• AMYOTROPHIC LATERAL SCLEROSIS

Q. A 46 year old carpenter-electrician had a severe fall on his buttocks about five years ago. No significant symptoms were apparent at that time. Three or four months later, however, he noted aching in his left forearm. He was treated with cervical traction, which relieved the pain. Several months later, he had some mild intermittent numbness of the left hand and wrist and muscle twitching in the left upper arm and the forearm.

The twitching subsequently spread to the muscles of the right arm, trunk and both lower extremities. The patient's left arm became increasingly weak, and his left leg dragged after he had walked a short distance. Weakness in his right hand developed to the extent that he was unable to hold a pencil. He was referred to a hospital for examination, the results of which were as follows.

The patient was slightly obese, alert and well oriented. His blood pressure was 130/85, basal metabolic rate +5 and +11 per cent, protein-bound iodine 7.3 per cent, and radioiodine 7.8 per cent.

Neurologic studies showed marked fasciculation of muscles of the trunk and all four extremities, particularly of the upper extremities, and some fasciculation of the tongue. There was atrophy of the left biceps and of muscles of both shoulders and the intrinsic muscles of both hands; this was more marked on the left side. Weakness was observed in the left hand and flexor and extensor muscles of the wrist and thumb. Reflexes of biceps and triceps muscles were hypoactive; Hoffmann's sign was negative and abdominal reflexes were absent. Knee and ankle jerks were slightly hyperactive, without clonic or pathologic signs; jaw-jerk reflex was present.

X-rays of the spine showed some narrowing of the intervertebral foramen at C5 and 6, more marked on the left than on the right side. Manometric tests of spinal fluid revealed no evidence of block with the neck in natural, extended or flexed positions. Myelograms showed some widening of the nerve sleeve at C5 and 6 on the left side and multiple small ventral bars at C4 and 5. It was felt that widening of the nerve sleeve could account for the rest of the amyotrophic pattern on the basis of the defect demonstrated in the myelogram.

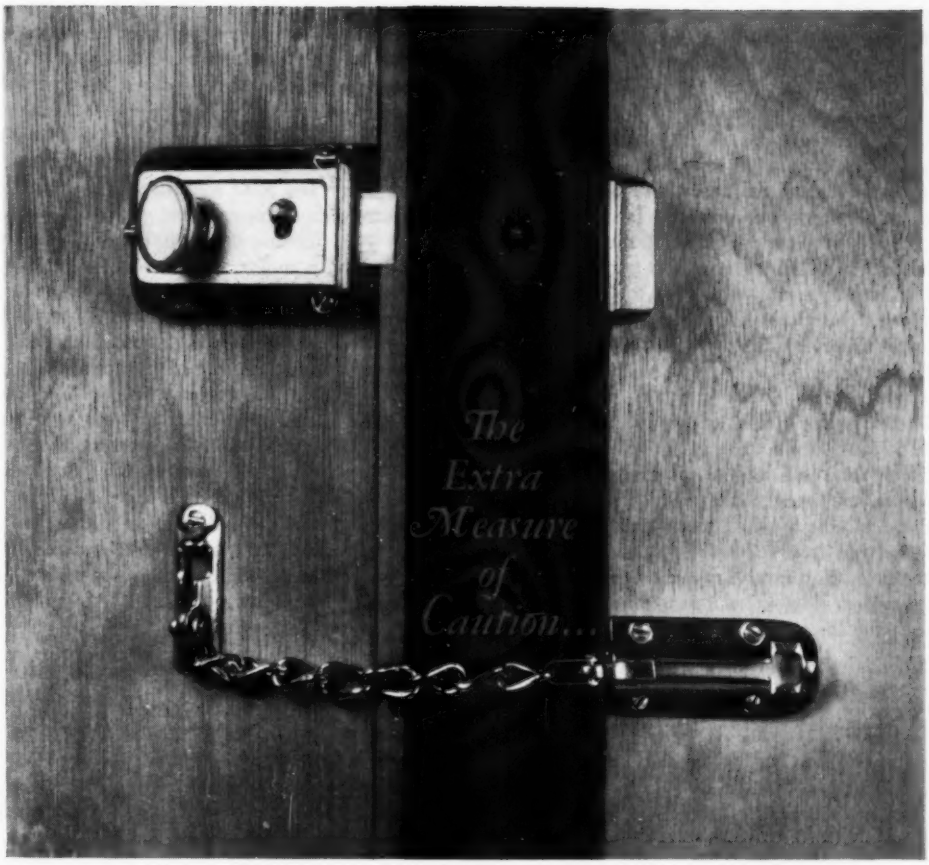
The diagnosis was amyotrophic lateral sclerosis. Because manometric tests in all positions gave normal results, surgery was not believed justified. What treatment would you suggest for this patient?

M.D.—Arkansas

A. The appearance of muscular atrophy, with fasciculations, cramping and weakness, is the most common mode of onset of amyotrophic lateral sclerosis. When pain is the initial complaint, as in this case, it is usually related to muscle weakness. Characteristically, the weakness and atrophy begin in one upper extremity and remain confined to it for several months or, occasionally, for as long as a year. Eventually, as in this patient, the disease spreads to involve the opposite and lower extremities.

Early in the course of the disease signs referable to the pyramidal tracts are seldom present;

(Continued on page A-24)



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later, clinical evidence of involvement of the pyramidal tracts is often masked by muscular atrophy and weakness. Objective sensory findings rarely have been described as complications of amyotrophic lateral sclerosis; in describing their weakness, however, many patients use the word "numbness."

Lesions within the cervical portion of the spinal canal, such as hypertrophic ridging of the margins of the vertebral bodies, may compress cervical nerve roots and result in localized muscular atrophy in the upper extremities and in hyperreflexia and spasticity in the lower extremities. Fasciculations usually are confined to muscles supplied by the involved cervical nerve roots. Sensory findings often are minimal, and pain in the cervical region or an upper extremity may or may not be present.

The findings in this patient suggest the presence of a widespread degenerative disease of the anterior horn cells of the spinal cord. The minimal abnormal results of myelography would seem to eliminate the possibility that this patient's difficulty arises from a localized cervical lesion. If, in addition to the symptoms described, there were evidences of muscular weakness and atrophy in the lower extremities and if electromyographic examination revealed evidences of widespread denervation of muscles of which the motor unit action potentials were much greater than normal, the diagnosis of amyotrophic lateral sclerosis would be more firmly established.

Neuronitis might be considered in the differential diagnosis of this patient's illness. Generally, in this condition there are paresthesia in distal portions of the extremities and a significant loss of vibratory and joint sensations. Neuronitis can be distinguished from amyotrophic lateral sclerosis by electrodiagnostic technics; in neuronitis, conduction in motor nerves is slow; in amyotrophic lateral sclerosis, motor nerves continue to conduct impulses at normal rates of speed.

Because the patient who has amyotrophic lateral sclerosis surely will be incapacitated and die from the illness and because, as was considered in this case, there are other neurologic diseases which may simulate this disorder and for which there may be helpful therapy, the diagnosis of amyotrophic lateral sclerosis must be firmly established. Although further study of this disorder eventually may result in adequate treatment for it, at present only supportive and palliative therapy can be employed.

(Continued on page A-26)

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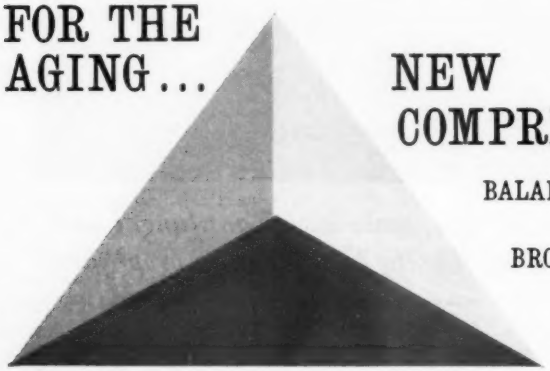

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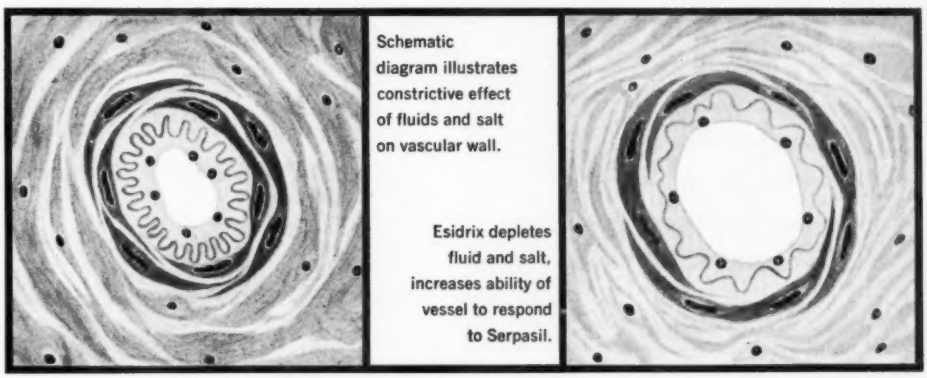
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• TREATMENT FOR GANGLION

Q. A workman has a ganglion measuring 1.5 to 2 cm. on the flexor tendon of the little finger at the junction of the finger and the palm. He refuses to have surgery. Would it be safe to use SOTRADECOL® or ethanolamine oleate B.P.?

M.D.—British Columbia

A. Surgical excision is the only recognized treatment for a ganglion of this size. Injection of various anti-inflammatory and sclerosing agents has been tried, but has not been successful. Some of these agents actually cause harm.

• STEROID THERAPY IN LARYNGITIS

Q. I would appreciate information and any available reference on the use of steroids in uncomplicated laryngitis.

M.D.—Maryland

A. There would seem to be no indication for the use of steroid therapy in ordinary acute laryngitis. However, when the acute laryngotracheobronchitis of children is present, in which there is a very marked swelling of the conus elasticus, steroid therapy is definitely indicated.

This type of treatment has been stressed by Dr. Francis W. Davison, George F. Geisinger Memorial Hospital and Foss Clinic, Danville, Pennsylvania.

• EOSINOPHILIA

Q. In a patient receiving iron therapy for hypochromic microcytic anemia, tests showed the hemoglobin to be 7 gm. per 100 ml. and the red blood cell count to be 4.5 million. Other hematologic findings were noncontributory. A study of the bone marrow was not done.

This patient also has a hiatal hernia. A trace of occult blood was present in the stools on two occasions; feces did not show ova or parasites.

Does the moderate eosinophilia in this patient indicate increased hematopoiesis?

M.D.—Ohio

A. The eosinophilia probably represents a mild reaction to therapy, or it may result from some unknown cause. In itself it does not suggest increased erythropoiesis.

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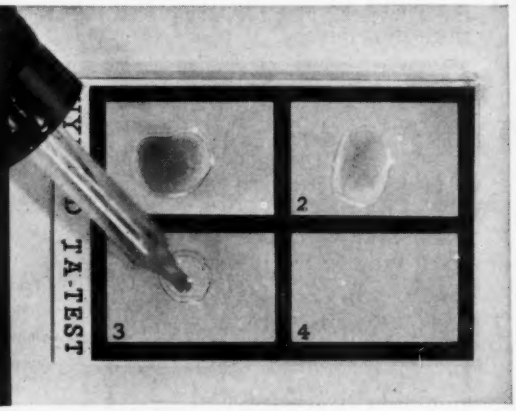

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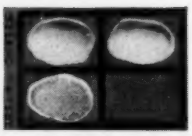

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3. Positive control

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What's happening in Medicine ?

POSTGRADUATE MEDICINE'S REPORT of late news of interest to practicing physicians

PERIPHERAL NEURITIS IN DIABETES

American Academy of Neurology:

• Of 103 randomly selected diabetic patients, evidence of neuritis was found in 43 and equivocal evidence in 13. An electromyogram showed denervation and slowing of conduction in peripheral nerves. In most instances, the neuritis was primarily sensory and diffusely involved the lower extremities. In 16 patients, one or more nerves were selectively involved, most commonly the peroneal or the median nerve.—Dr. Donald W. Mulder, Mayo Clinic, Rochester, Minn.

• Thirteen patients with aneurysmal subarachnoid hemorrhage were treated by induced hypotension, regardless of age, complicating illnesses, problems of cross circulation, reaction from carotid compression, location of the aneurysm, or recency of bleeding. Hypotensive therapy is valuable in the acute stage of bleeding. After recovery from the acute stage, further medical or surgical treatment must await more data.—Dr. Paul S. Slosberg, Mount Sinai Hospital, New York.

• A follow-up study of seven patients in whom hemispherectomy was performed following intractable seizures in early infancy showed that three were free of seizures five years later on no medication. Useful motor function had returned to a variable degree, but involvement of the visual field and impairment to deep and cortical sensation have persisted. Intellectual capacity is above average in one patient, within normal range in another, and at borderline level in the third.—Dr. Eugene B. Spitz, Philadelphia.

CULTURAL FACTORS IN CANCER

Conference on Culture, Society and Health, New York Academy of Sciences:

• The population of Hawaii is composed of about 35 per cent Japanese, 23 per cent Caucasians, 18 per cent Hawaiians, 12 per cent Filipinos, 6 per cent Chinese, and 6 per cent other races. The incidence of cancer of the stomach is highest in the Japanese, probably as a result of their diet. The Filipinos and Japanese, who smoke fewer cigarettes, have the lowest incidence of cancer of the lung. Cancer of the breast occurs five times more frequently in Caucasians than in the Japanese, who nurse their children longer. Primary cancer of the liver is most frequent in Filipino men, whose diet is higher in carbohydrates and lower in protein and vitamin B_1.—Dr. Walter B. Quisenberry, State Department of Health, Honolulu.

Polyps potentially cancerous

National Medical Association:

• Adenomatous polyps of the large intestine are unequivocally potentially malignant. A review of 1500 patients in a 16 year period showed a significant proportion of carcinomas of the colon and rectum.—Dr. I. S. Ravdin, University of Pennsylvania School of Medicine, Philadelphia.

Clinician's view of pancreatitis

Michigan State Medical Society:

• A history of typical seizures remains the cornerstone of a diagnosis of pancreatitis. Hyperparathyroidism may be associated with pancreatitis more often than has been realized. This association has been seen in four patients at the Mayo Clinic in the past three years. The puzzling association of hyperlipemia and pancreatitis in other cases invites further study. Heredity may play a role in some forms, and a more intensive search should be made among blood relatives of patients with pancreatitis.—Dr. John B. Gross, Mayo Clinic, Rochester, Minn.

• Diverticulitis of the colon is revealed in about one-third of the patients having barium enema examinations at the Massachusetts General Hospital. Frequency is related to age. While diverticula can be treated successfully by medical measures in most instances, a reduction in surgical morbidity and mortality in the past decade has led to changing concepts of the therapy and complications of this disease. Surgical resection of the involved segment of the bowel is being done with increasing frequency.—Dr. Gordon A. Donaldson, Massachusetts General Hospital, Boston.

• The most striking advance in treating malabsorption disorders has been the introduction of the gluten-free diet for patients with nontropical sprue. It has changed the whole concept of the nature and management of this disease. —Dr. Henry J. Tumen, University of Pennsylvania Graduate School of Medicine, Philadelphia.

Cholesterol level nonpredictive

International Association of Gerontology:

• The serum cholesterol level was found to have little predictive value for cardiovascular disease in a group of 134 veterans of the Spanish-American War. Mean levels generally remained below those for both younger cardiac patients and younger persons used as controls.—Dr. Joseph M. Looney, Veterans Administration Outpatient Clinic, Boston.

Methotrexate in basal-cell carcinoma

American Dermatological Association:

• Seven patients with multiple extensive basal-cell carcinomas were treated systemically with the folic acid antagonist methotrexate. Marked clinical and histologic damage occurred in the lesions, with complete clinical disappearance of some of them. Methotrexate's effect on basal-cell carcinoma is comparable to its effect on other tissues with high mitotic rates.—Dr. Eugene Van Scott, Bethesda.

• A peculiar syndrome, whose essential feature is the insidious development of hyperpigmentation of the face and occasionally of the neck, has occurred with increasing frequency during the past few years in southern California. It has been seen predominantly in women, who otherwise appear to be essentially healthy. Its exact etiology is undetermined.—Dr. Victor D. Newcomer, Los Angeles.

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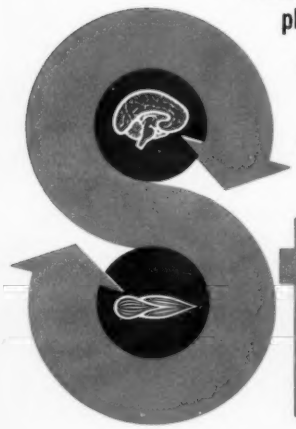

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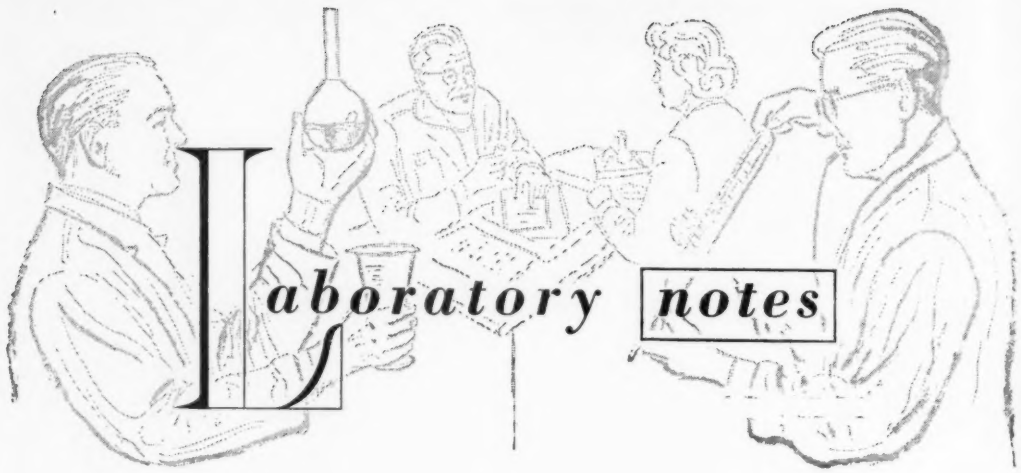

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ELLIS S. BENSON* AND ESTHER F. FREIER†

University of Minnesota Medical School, Minneapolis

MODERN medicine makes demands on the laboratory which can be met only by improved standards of performance. Crude, qualitative analyses, often performed by the physician himself, have been replaced in many cases by precise, quantitative ones performed in the laboratory by technologists without direct recourse to the patient. The lines of communication between the physician at the bedside and the laboratory may be slender. Reports from the laboratory may arrive in numerical terms, for example: "The blood glucose is 110 mg. per cent." The communication suggests great accuracy and precision. Is this justified? In some cases, notably in the determinations of serum calcium and serum potassium, great precision is needed to make the interpretation meaningful. How good an estimate is made? In short, what is the *quality* of the effort on which the result expressed in the report is based?

In 1946 and 1947, the Medical Society of Pennsylvania instigated a survey to determine the accuracy of performance of some of the more common chemical measurements in hospital laboratories throughout the state. The solutions carefully prepared for analysis were distributed to the 59 laboratories which participated. The results of the survey were reported by Belk and Sunderman[1] in 1947. Typical findings in regard to hemoglobin analyses are illustrated in figure 1. For calcium, prepared at 12.6 mg. per 100 ml., values ranging between 7 and 26.6 mg. per 100 ml. were reported. Results obtained for urea, sodium chloride, glucose and total serum protein varied in a similar manner. The test

(Continued on page A-40)

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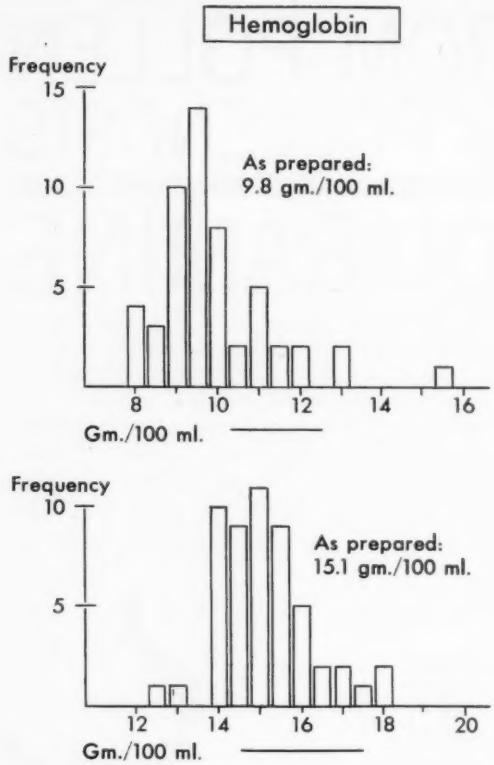

FIGURE 1. Results of a survey on hemoglobin analyses. Note the wide variety of values reported by the laboratories surveyed.

(Reprinted by courtesy of Drs. W. P. Belk and F. W. Sunderman.[1])

solutions were found on return to the referee to have remained unchanged during transit.

More recent surveys have shown similar patterns of interlaboratory variation.[2] Some results of a survey recently conducted by Dr. Richard Doe,[3] Veterans Administration Hospital, Minneapolis, are illustrated in figure 2. The shaded areas indicate the range of variation among six laboratories acting as referees. Results on other serum and blood constituents were very similar to those illustrated. Of 10 laboratories, two to four reported results well outside an accepted range. In a survey conducted by Dade Reagents, Inc., in 600 laboratories throughout the United States in 1958, six serum electrolytes were analyzed. Over-all results showed a coefficient of variation of greater than 10 per cent for three of the constituents analyzed (chloride, phosphorus and magnesium).[4]

Belk and Sunderman concluded on the basis of questionnaires filled out by directors of the laboratories they surveyed that the two chief reasons for the technical inaccuracies disclosed by the survey they reported were poorly trained technicians and an inadequate number of technicians or technologists. One might add to these a misplaced emphasis by those in authority on the volume of laboratory reports, which is detrimental to the quality of the work performed.

In many determinations, the question of precision is crucial to interpretation of the result. For example, the range of normal serum calcium is narrow, and abnormal results, important diagnostically, may be near the normal range.[5] Poorly standardized hemoglobin determinations have resulted in an increased volume of blood transfusions with needless risk to patients and with unnecessary expense to them, their relatives and their friends.[6,7] Protein-bound iodine determinations have proved to be of great value in the management of thyroid disorders. Their relative lack of precision and vulnerability to contamination and other technical hazards can be met only by using strict control measures.

What is quality control and what are these control measures? Quality control is a term borrowed from industry, and in the clinical laboratory it is used to describe methods which may be used to monitor the quality of all steps in an analysis and which signal the presence of factors that may invalidate the result. These factors include lapses in technic, deterioration of reagents, contamination, and instrumental failures.

A previous column[8] touched very briefly on some useful measures of quality control. Freier and Rausch[9] have discussed the subject more extensively, and the discussion which follows is largely based on their observations.

The factors of quality control in the chemistry laboratory of the University of Minnesota Hospitals are the following: (1) standard

(Continued on page A-42)

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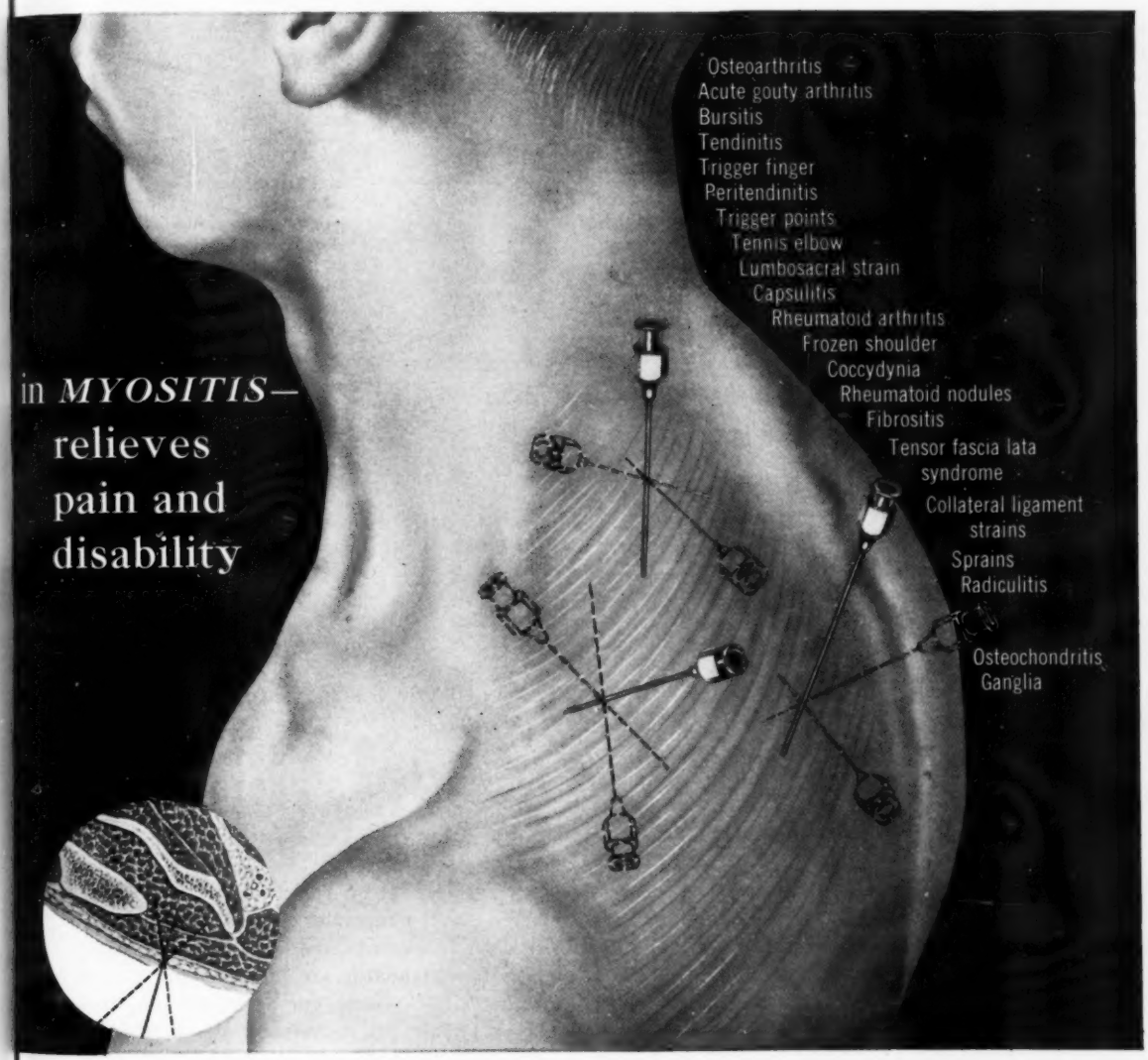

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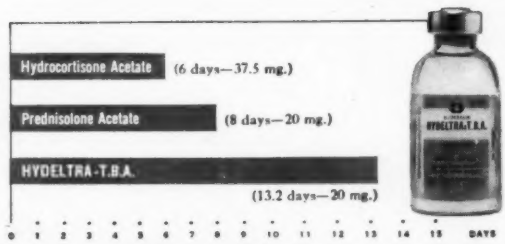
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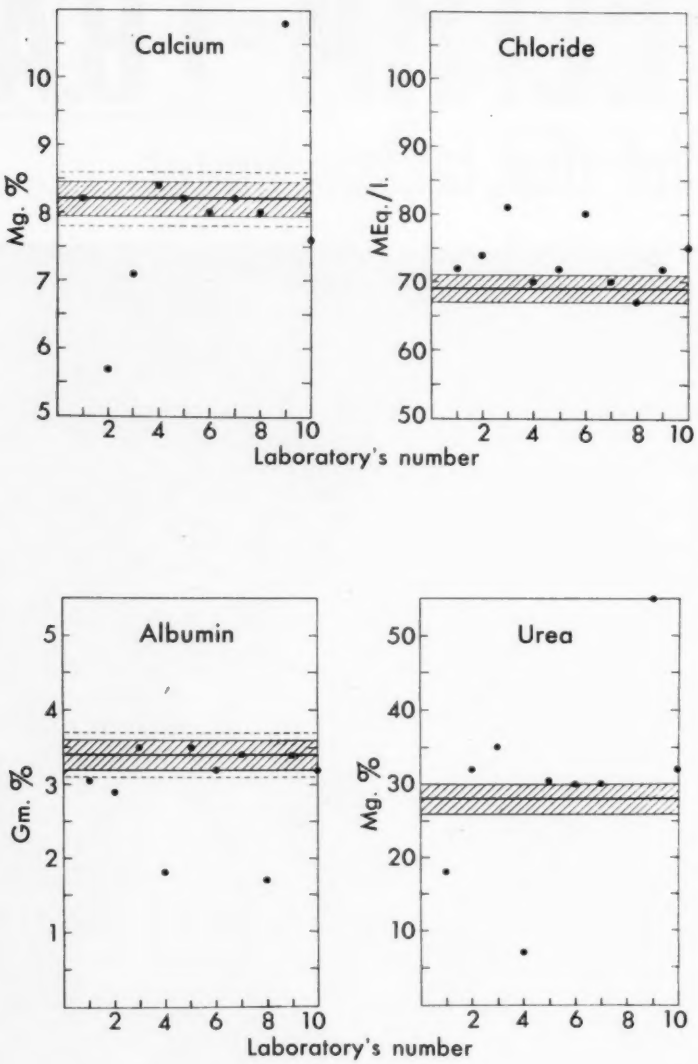

FIGURE 2. Some results of a survey conducted by Dr. Richard P. Doe.[3] Shaded areas include range of variation among six reference laboratories. Dotted lines in albumin and calcium charts enclose values varying 5 per cent or less from the mean value obtained by reference laboratories. Dots represent values reported by laboratories surveyed.

(Reproduced by courtesy of Dr. Doe.)

solutions, (2) replicate analyses, (3) recovery of added determinant, (4) reference methods, and (5) control solutions. The use and value of each of these will be described briefly.

1. Standard solutions. If possible, standard solutions should be included in each analysis. These solutions are prepared from pure dried reagents (analytical reagents). At least two concentrations should be included in each batch as a check on linearity, validity of the calibration, and on variations from batch to batch due to temperature, age of reagents, etc. In some procedures, notably determination of bilirubin, standards are unstable and cannot be used. In this case, one has to rely on other control measures to validate the permanent calibration.

2. Replicate analysis. The precision of a method under actual working conditions may

(Continued on page A-44)

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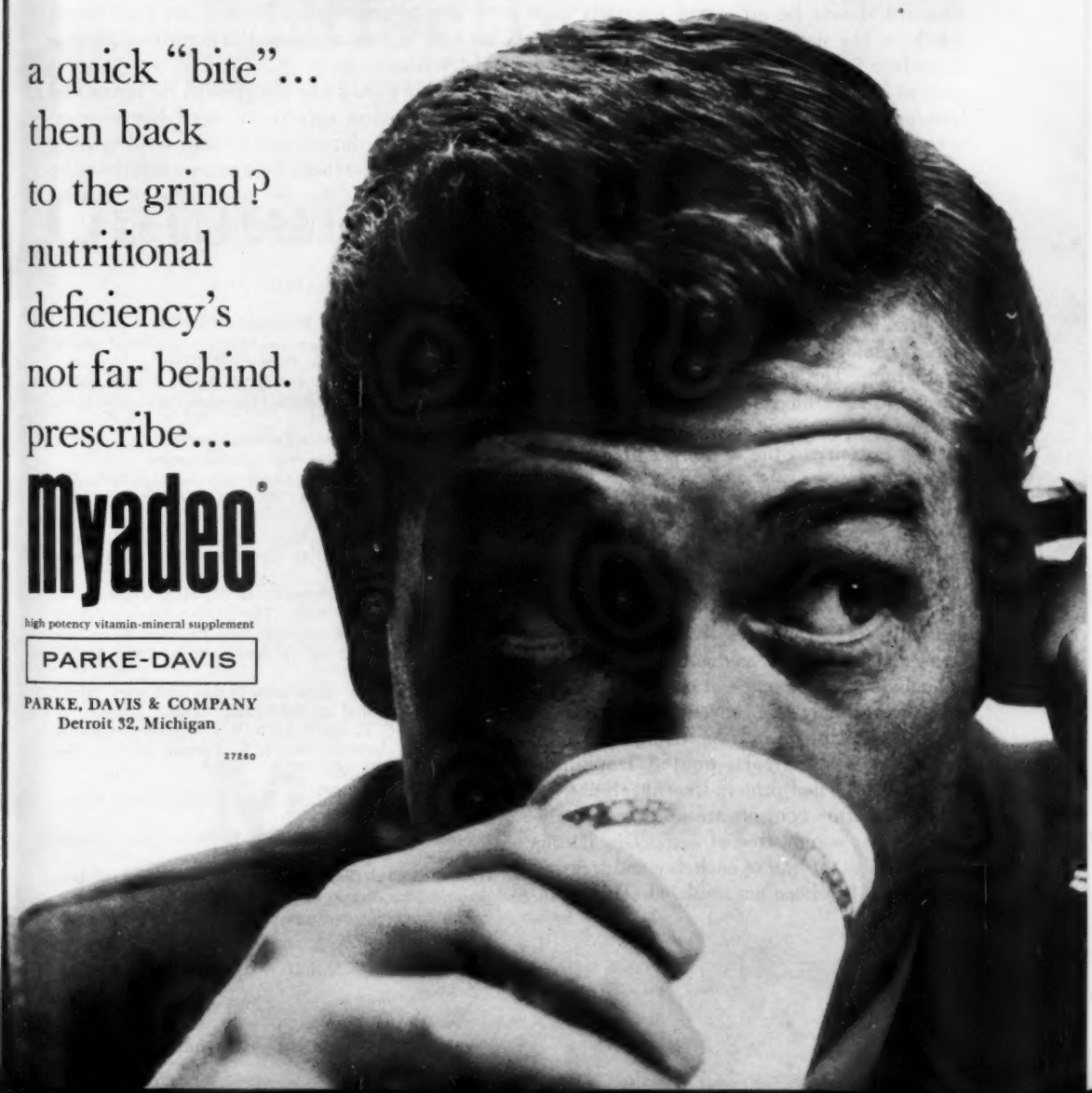

be monitored by replicate analysis. All samples should be run in duplicate on procedures in which the precision is low (for example, determination of protein-bound iodine) or in which the highest precision possible is required for interpretation of results (for example, determination of serum calcium).

3. Recovery of standard determinant. A means of analyzing the accuracy of a method of analysis is the recovery of a standard determinant added to an unknown sample. All procedures should be tested in this manner, initially at least, to ascertain whether the method truly measures the constituent one seeks to measure. Recovery of the added standard should be estimated regularly as a check on the activity of the enzyme in any procedure in which an enzyme is used as a reagent in the analysis (for example, the determination of blood urea nitrogen by the urease method).

4. Reference methods. Results of a determination, when questioned, may be validated by using an alternate method of analysis, one of established reliability. This, however, is too cumbersome a means of control for routine use in most analyses. This control measure has been useful in our hands in the determination of hemoglobin, in which we use a permanent graph. The calibration is checked once a week (and at intermediate times if the calibration is questioned) by determination of oxygen capacity by the Van Slyke manometric analysis.

5. Control solutions. One of the most useful and simple means of day-by-day quality control is the use of control solutions. By this means, any clinical laboratory which performs chemical analyses may study continually the reliability of its analyses. When this method is used, at least one control solution should be included in each batch of unknown samples undergoing analysis. Many different types of control solutions may be used, including pooled serum controls, pooled lyophilized serum, and pooled protein-free filtrates.

Pooled serum controls are prepared by collecting clear serum, free of hemolysis, icterus or lipemia, at the end of each day and freezing it until 2 l. has been accumulated. This quantity is then thawed, mixed gently but thoroughly, cleared by centrifugation, and divided into 2 ml. aliquots in vials which are corked tightly and refrigerated without preservative at −10° to −20° C. until used.

Pooled lyophilized serum is prepared in the same way but, in addition, is lyophilized and thus may be kept at room temperature, except in the case of samples used in enzyme analysis, which should be kept at low temperature. This preparation probably has better "keeping power" than frozen pooled liquid serum. Some commercial laboratories supply control serums in this form, analyzed for a number of constituents.*

Pooled protein-free filtrates are kept frozen at −20° C. and are useful in control of glucose determinations.

When should one use control measures and what measures should one use? Every quantitative procedure should be controlled in some way. In next month's column, we will describe in more detail the use and value of quality control measures in clinical chemistry.

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*Versatol, Warner-Chilcott Laboratories, Morris Plains, New Jersey.
Labtrol and Pathotrol, Dade Reagents, Inc., Miami, Florida.
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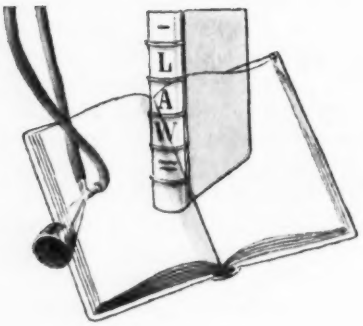

Forensic Medicine

Barbiturates, Automatism* and Suicide

ROWLAND H. LONG†

Massachusetts Mutual Life Insurance Company, Springfield, Massachusetts

CARBON monoxide excepted, the barbiturates are the commonest agent for suicidal purposes today.[1-5]

ROWLAND H. LONG

The parent of the barbiturates is barbituric acid. This acid has hundreds of derivatives, but about 20 are therapeutically useful. Each derivative has a chemical and a registered name and is usually sold under its registered name. All have the same therapeutic action, but each has an individuality. Barbiturates are used therapeutically as sedatives, hypnotics and anticonvulsants. They are a principal therapeutic agent in the control of convulsions in epilepsy. Some of the series are used as anesthetics and as adjuvants with analgesics.

Barbiturates have been classified according to the speed of their therapeutic action into:

1. Long-acting, e.g., ALURATE®, barbital, DIAL®, IPRAL®, NEONAL®, and phenobarbital.
2. Intermediate-acting, e.g., AMYTAL®, ORTAL® sodium, PERNOSTON®, and SANDOPTAL®.
3. Short-acting, e.g., EVIPAL®, NEMBUTAL®, and SECONAL® sodium.
4. Very short-acting, used intravenously as an anesthetic, e.g., Evipal, PENTOTHAL® sodium, and thioethamyl.

The rapidity with which barbiturates act on the body depends on (1) the nature of the de-

(Continued on page A-58)

*The psychologic definition of automatism is any action performed without the doer's intention or knowledge.

†Vice-president and General Counsel, Massachusetts Mutual Life Insurance Company, Springfield, Massachusetts.

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1,928 published cases in the two years since TAO was released for general use show:

94.3% effectiveness in respiratory infections (617 cases including tonsillitis, staphylococcal and streptococcal pharyngitis, bronchitis, infectious asthma, broncho-pneumonia, lobar pneumonia, bronchiectasis, lung abscess, otitis.) **You can count on TAO.**

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87.1% effectiveness in genitourinary infections (349 cases including urethritis, cystitis, pyelitis, pyelonephritis, orchitis, pelvic inflammation, acute gonococcal urethritis, lymphogranuloma venereum.) **You can count on TAO.**

75.8% effectiveness in diverse infections (62 cases including fever of undetermined origin, peritoneal abscess, osteitis, periarthritis, septic arthritis, staphylococcal enterocolitis, gastroenteritis, carriers of staphylococci.) **You can count on TAO.**

95.6% of 1,928 cases free of side effects—in the remaining 4.4%, reactions were chiefly mild gastrointestinal disturbances which seldom necessitated discontinuance of therapy.

*In 884 of 1,928 cases the causative organisms were mostly staphylococci. The majority of clinical isolates were found to be resistant to at least one of the commonly used antibiotics and many patients had failed to respond to previous therapy with one or more antibiotics. **TAO proved 93.4% effective in these 884 cases.**

Complete bibliography available on request.

DOSAGE: varies according to severity of infection...Usual adult dose—250 to 500 mg. q.i.d. Usual pediatric dose: 3-5 mg./lb. body weight every 6 hours.

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TABLE 1

CLINICAL DATA ON SOME BARBITURATES

DRUG	CLASS	AVERAGE TIME REQUIRED TO INDUCE SLEEP (MINUTES)	AVERAGE THERAPEUTIC DOSE (GM.)	APPROXIMATE LETHAL DOSE (GM.)
Pentobarbital (Nembutal)	Short-acting	5 to 10	0.1 to 0.2	2.5
Secobarbital (Seconal)	Short-acting	5 to 10	0.1 to 0.2	2.5
Amobarbital (Amytal)	Intermediate-acting	10 to 15	0.1 to 0.3	2.3
Barbital (VERONAL®)	Long-acting	20 to 30	0.3	5 to 20
Phenobarbital (LUMINAL®)	Long-acting	20 to 30	0.03 to 0.1	6 to 9

rivative as to whether it is long-, intermediate-, or short-acting, and (2) on the method of administration. Oral administration is the most common method and the one of choice, unless contraindicated. Oral administration only will be discussed.

The short-acting barbiturates are usually prescribed for insomniacs who do not fall asleep readily. The long-acting ones may be prescribed for patients who have no difficulty falling asleep, but who wake up in four or five hours.

The amount constituting a lethal dose varies widely with the class of barbiturate used. Physicians generally agree that the toxic dose of a barbiturate is 5 to 10 times the full therapeutic dose. A fatal dose is usually 10 to 20 times the therapeutic dose. Recoveries from massive doses have been reported.[6,7]

Table 1 gives some facts about a few barbiturates used clinically.

Deaths resulting from an overdose of barbiturates frequently present medicolegal problems. Hence, it is of medicolegal importance to determine whether the barbiturate ingested was a long-acting or short-acting one and how rapidly it would induce sleep.

Automatism

An interesting psychologic symptom of barbiturate poisoning was presented by Richards in 1934,[8] which he was pleased to call "automatism." This symptom, wrote Richards, was most easily described through three cases.

Case 1—"A professional man, aged 42, was taking Dial tablets (each 1½ gr.) for insomnia. He took one tablet and, failing to fall asleep, took a second. From that time he lost all knowledge of what he was doing, and apparently went on taking tablets at intervals until he had emptied a complete tube of 10. He slept for 36 hours, and on waking had no recollection of taking more than two of the tablets."

Case 2—"A nurse, aged 35, had a precisely similar experience, also with Dial. She emptied a tube in which there were eight tablets, again without any recollection of having taken more than two."

Case 3—"A professional man, aged 76, who was in the habit of taking Veronal (7½ gr. tablets) swallowed in a similar way eight of these tablets, and after sleeping for 24 hours assured me he had had only two, at intervals of one hour between the doses."

None of these cases show whether these tablets were taken one after another or were taken all at one time after the second tablet was taken.

"It would appear," wrote Richards, "that the knowledge of the need for another tablet persists, while the memory is so affected by the drug that the patient does not realize that he has already satisfied the need, and automatically repeats the dose at intervals. Though all three patients recovered it has to be noted that in each instance the available supply was exhausted, and had a larger quantity of the drug been at hand there is no reason to believe it would not have been all taken, with possibly fatal results."

(Continued on page A-60)

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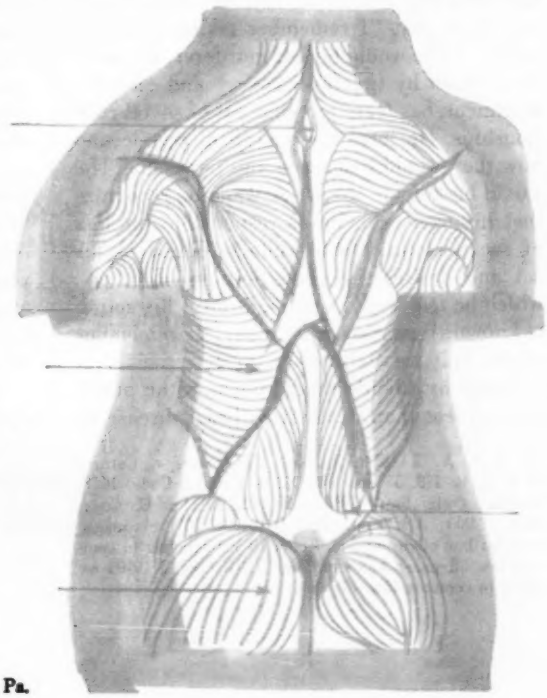

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The literature following Richards' announcement of automatism has generally made no distinction between the effect of long-acting and short-acting barbiturates. In each of Richards' cases the patient had no recollection of having taken more than two tablets. Richards has not given the background of his patients. He has overlooked the motive or reasons that these persons may have had to make the statements attributed to them.

Attempted Suicide

On the facts presented by Richards, it is not suggested that any of his patients attempted suicide. But when a man takes more than a therapeutic dose of a barbiturate, is found unconscious, has a stay in a hospital and some unpleasant newspaper publicity, he will try to give an explanation for his conduct. How easy it is then to say, "I only remember taking two tablets."

Attempted suicide is a crime by statute in some states and a crime at common law in others.* It is a crime in the British Isles under the common law and in Canada under the criminal law. Suicide and attempts thereat are definitely condemned by ecclesiastical law.

If no prior attempt is known and no note has been left indicating suicide, it is simple enough to say, "I remember taking only two tablets." The would-be self murderer, snatched from death by timely discovery and effective treatment, has fears growing out of social relationships. He fears the speech of people and how they would disparage and persecute. The would-be suicide does not want to recognize that his own behavior is responsible for loss of social status. He is quite ashamed of his act and desires the good opinion of others, which he fears will be denied him if his action is known. How easy it is to say, "I remember taking only two tablets."

Death by suicide should concern the physician no less than death from heart disease or cancer. The physician should not brush off the act of taking an overdose by suggesting or accepting an easy explanation.

*N. J. S. A., 2A:85-1, 2A:85-7. See States v. Carnev, 69 N. J. L. 478, 55 Atl. 44; N. D. Revised Code, 1943, 12-3302; Okla. Stat., 1951, pp. 812, 818; S. D. Code, 1939, 13.903; Ark. Stat., 1947, 1-101, 41-107 relating to common law offenses; Ida. Code, 18-303 relating to common law offenses; Laws of Mich., 1948, sec. 750.505 relating to common law offenses.

Discussion

Locket and Angus,[9] reviewing 64 consecutive cases of barbiturate poisoning entering Oldchurch Hospital in Romford, England, in the four preceding years, found 49, at least, were suicidal attempts. In 52 cases of this group, barbiturates were the chosen agents. It is significant that out of 52 cases not one of automatism was found. "In all, 47 patients definitely admitted to an attempt to take their own lives, and two patients who died left messages behind; then there were 49 definite suicidal attempts among the patients. Of five patients who categorically denied any suicidal attempt, one had made two previous attempts and had been certified to a mental hospital and one had been a voluntary patient with a depressive state. Eleven patients had been or were prepared to be voluntary patients in mental hospitals, and four had been or on recovery from the barbiturate were certified insane. In 19 cases the psychiatrist expressed the opinion that the patient was in a severe depressive state at the time of the attempt and in 12 others there were severe social or domestic disturbances. Two patients had menopausal symptoms; six had an anxiety state; five were epileptics, and three were schizophrenics. The other patients at the time of the attempts had among them the following organic diseases: exfoliative dermatitis (skin condition not related to the barbiturate taken), congenital hemiplegia, disseminated sclerosis, pulmonary tuberculosis, duodenal ulcer, asthma, and severe essential hypertension. One was pregnant and unmarried. At least nine of these 64 patients gave a history of one or more previous attempts at suicide."

Dr. William D. McNally,[10] former toxicologist for Cook County and the Chicago Health Department, commenting on Richards' reported cases, suggests that "It is very strange that of the large number of cases of acute intoxication and in cases which have been investigated by the Cook County coroner's staff and my-

(Continued on page A-62)

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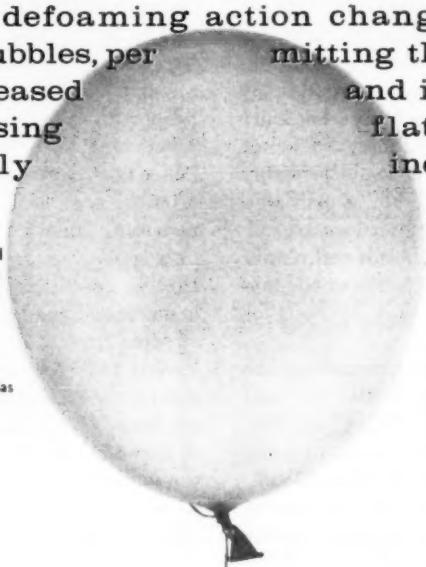

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self, there has not been one case of automatism present itself."

Many writers of articles and textbooks on barbiturate poisoning have accepted without question Richards' conclusions based on the meager evidence of three cases. In discussing Richards' suggestions, they have frequently embellished them. It is strange indeed that no writer has presented either a case record of his own or of any other physician in which automatism played any part. Few writers have even attempted to distinguish between the more rapid and the slower sleep-inducing action of the different classes of barbiturates. No writer has discussed the fact that a person taking several single therapeutic doses would necessarily be sound asleep long before he could take a toxic, far less a lethal, dose. No writer has considered the fact that it would probably be physiologically impossible for a man who had taken a second therapeutic dose to manipulate the cork of a small bottle and obtain a third tablet without spilling some of the tablets or dropping the bottle, cork or both, or failing to recork the bottle.

Goldstein,[1] in an interesting paper on the nature of problems relating to the use and misuse of barbiturates, wrote: "Many accidental cases of barbiturate intoxication are discovered and treated before death takes its toll. Frequently these individuals tell of having taken the usual dose of the drug which did not bring sleep. Then, in the mentally befuddled state induced by the barbiturate, they took more of the drug. How much more they did not know. Barbiturates have now achieved the questionable honor of being chosen as the chemical instrument of suicide, second only to carbon monoxide."

In a private communication, Goldstein made this commendable statement: "You state that most references to this phenomenon stem from the report of Robert Richards (Brit. M. J., page 331 [February 24] 1934). You may include my name in the list of those who made this statement based on literature reports rather than personal observation or interrogation of such cases."

Goodman and Gilman[3] had this to say: "Acute barbiturate poisoning may occasionally be due to what is called 'automatism.' For example, failure of the drug to produce sleep may cause a confusional state in which the patient does not remember having already taken medication and he may unwittingly repeat an overdose."

In a private communication Goodman stated with the frankness that is characteristic of professional men of high standing that, "Other than the three nonlethal cases reported by Robert Richards in 1934, I do not recall seeing published reports on the phenomenon 'automatism' in barbiturate poisoning."

Tatum,[2] writing for *Physiological Reviews* five years after Richards' reported cases, commented: "In many cases, perhaps the greater proportion, the poisoning is intended suicide; others develop a psychic dependence, and hence take the drugs in too large dosages, long after the need has ceased, and develop chronic poisoning; finally there is that peculiar condition spoken of as 'automatism' by Richards. In this condition the individual, having become accustomed to the use of the drugs, may at some time fail to have deep sleep develop. In this twilight zone, an individual does not exert normal inhibitions and reason, and hence mechanically takes all the remaining tablets or capsules. In these cases, the coroner's jury pronounces the cause of death as suicide, and so it is, but it should be recognized scientifically as unintentional or accidental suicide."

He cited no supporting cases, other than Richards' cases. How can anything be "scientifically recognized" on the sole report of three cases which were poorly reported in the first place? To speak of suicide as "unintentional or accidental" is sheer nonsense. Suicide is self-murder or a deliberate and intentional taking of one's own life.

Shideman wrote:[11] "Hence, self-medication is the most common cause of acute poisoning with the barbiturates, intended suicide probably accounting for the majority. Unintentional poisoning from self-administration may be the result of 'automatism.' Here the usual hypnotic dose may fail to produce sleep and the individual in a semistuporous state consumes all the capsules or tablets remaining in the

(Continued on page A-64)

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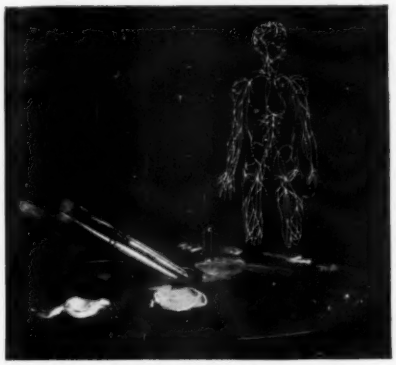

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SIDE EFFECTS: Same type as with reserpine but usually with reduced incidence or severity, e.g., mental depression, bradycardia, nightmares, and fatigue. Nasal stuffiness or congestion may occur but usually disappears with discontinuation of the drug or on use of topical vasoconstrictors or antihistamines. Increased frequency of defecation and/or looseness of stools is an occasional reaction. There have been occasional reports of serious hypotension in persons on *Rauwolfia* compounds who undergo surgery with general or spinal anesthesia. It is suggested that MODERIL be discontinued two weeks before surgery, when feasible, or other appropriate measures be taken.

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container. Death, if it occurs, may be incorrectly labeled suicide, but should be recognized as accidental suicide."

He presented no case records, although he was writing 20 years after Richards' report. It is significant that he was content to adopt Tatum's inaccurate statements. So it is readily seen that the "pitch" is from Richards to Tatum to Shideman (and others) without a scintilla of the brilliance and accuracy of the double play from Evers to Tinker to Chance.

Eighteen years after Richards' paper was published, Salter[12] observed that, "Another problem which plagues medical examiners and coroners is the phenomenon known as 'automatism.' This situation has been authenticated numerous times." (*Comment:* This reckless statement is unsupported by case history or otherwise.)

"The sleepless patient has a bottle of capsules or tablets by his bedside. If the drug happens to be a slow-acting one or if the patient is unduly resistant, he keeps on taking a tablet every 10 or 15 minutes, praying for sleep. Eventually he reaches a sort of semistuporous twilight zone in which, without understanding what he is doing, he continues automatically to take one tablet after another."

(*Comment:* This is an unwarranted assumption. It ignores the fact that the patient would have been asleep long before he could have taken an amount approximating a lethal dose.)

Twenty-three years after Richards reported his cases, the *New England Journal of Medicine*[13] published this statement: "Undoubtedly, an occasional poisoning from automatism has occurred. This is an interesting phenomenon whereby the patient, after taking a dose of a barbiturate, forgets or at least thinks he has not taken the drug and so takes another dose and yet another until he has ingested a poisonous amount."

A private communication from the journal contains this comment: "It is a well-recognized phenomenon that patients who get a small dose of barbiturates do become confused and frequently think that they have not taken a dose of the drug. The problem of automatism may occur more frequently than is suspected. It is discussed in Goodman and Gilman, 'The Pharmacological Basis of Therapeutics,' second edition, published by The Macmillan Company, 1955, on page 146, and also by Salter in 'A Textbook of Pharmacology,' published by W. B. Saunders Company, 1952, on page 102. Every textbook of note in the field of pharmacology has commented on automatism. As to the frequency of this phenomenon, I have no figures; and I imagine to secure such would be most difficult. However, there are apparently many authenticated cases where automatism has occurred, so that there is little doubt in medical circles that automatism does occur."

Goodman relied on Richards. Salter cited no authority and reported no case.* It excites curiosity to read in one sentence that figures on frequency of this phenomenon would be difficult to secure and in the next to learn that there are "apparently many authenticated cases where automatism has occurred." No writer has presented any authenticated case since Richards reported three cases more than 25 years ago.

Dr. Robert H. Felix,[14] director, National Institute of Mental Health, in an interview said, "We also know that it does something very bad to the judgment, so that probably many of the so-called suicides from sleeping pills are due to the fact that a person couldn't sleep and he took a couple. He still didn't get to sleep and he took a couple more. Still, he didn't get to sleep, and by that time he had been sufficiently fuzzed up that he didn't realize how many he was taking, and he took a whole handful of them to do the job. He probably had no intention of killing himself when he started; he just got all fuzzed up."

How does he know that "he took a couple . . . and he took a couple more"? Dr. Felix didn't say what class of barbiturate was taken or what the therapeutic dose was. He overlooked the simple fact that four therapeutic doses would have put the patient in dreamland. To lend drama to the occasion he continued, "he took a whole handful of them,"

*I wrote to Dr. Salter requesting information about his statement and was told that he had died approximately five years ago.

(Continued on page A-66)

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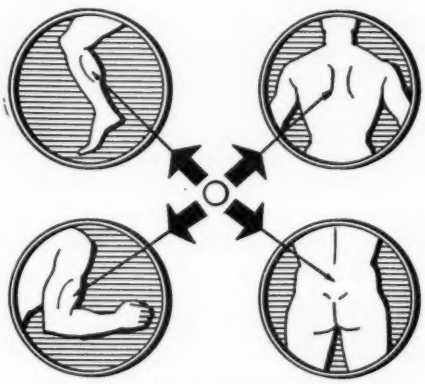

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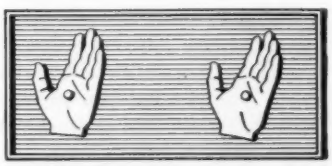

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Other patents pending

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and then added, "to do the job." It is suggested that the "job" was suicide.

I wrote to Dr. Felix in part as follows: "If you know of cases other than those described by Richards in the *British Medical Journal* of February 24, 1934, I would appreciate your letting me know of them.

"I would be grateful if you would tell me of a case where a whole handful of barbiturates was taken at one time."

His reply contained this statement: "The basis for this comment is my own clinical experience and the clinical experience of many others in the field."

It is suggested that Dr. Felix should either prove the accuracy of his statements by authenticated cases or frankly recant his barren assertions which are too transparent to gain credence among scientists.

Fraser,[15] Isbell,[15,16] Thrower[17] and others have accepted Richards' idea of automatism, but none have reported any case in which automatism played any part.

It is interesting to note the marked similarity in the comments on the symptom which Richards termed automatism by all of the writers previously mentioned. Such similarity can indicate only that the comments are mere "hand-me-downs," without careful consideration of the original source material.

Lucille M. Schroeder* brought action to recover an accidental death benefit under the terms of a life insurance policy. She claimed that her husband took an overdose of sleeping pills accidentally. The insurer paid the face amount of the policy and denied liability for the accidental death benefit, asserting that the insured committed suicide. In the trial she made an attempt to show that the decedent took a large number of ETHOBRAL® capsules, one after another, because his mind became foggy after the first or second dose.

The facts of the case were briefly these. A 50 year old man used alcohol to excess on numerous occasions. The day before his death he got drunk. His wife thrashed him with a riding crop. She then fed him and he became sober. He drank no alcohol from 6:00 P.M. until 11:30 P.M. when he retired to his bedroom. His parish priest and physician saw him in the evening and described his conduct as rational. He was heard snoring 10 minutes after he retired. He was snoring at 12:10 A.M. when his wife passed his bedroom door. He was found dead at 10:30 A.M. the same day.

Deceased had injured his ankle, and 2 gr. Ethobral capsules had been prescribed. Ethobral consists of secobarbital, phenobarbital, and butabarbital. The purpose of the mixture is to produce an immediate and also a sustained action on the body.

An autopsy was performed the day he died and a chemical examination of certain organs was done. It showed 2.8 mg. of barbituric acid ester per 100 gm. of brain tissue. In the trial the proof showed that the cause of death was barbiturate poisoning.

Defendant called Dr. Milton Helpern, Chief Medical Examiner of the City of New York, as a medical specialist. He was asked this question: "Assume that decedent weighed 180 lb. and had taken an unknown number of 2 gr. Ethobral capsules. He retired to his bedroom at 11:30 P.M. and was heard snoring 10 minutes later. He was still snoring at 12:10 A.M. when his wife passed his bedroom door. He was found about 10:15 A.M. the same day with bubbles of air coming from his mouth. He was pronounced dead at 10:30 A.M. and an autopsy was performed the same day. There was 2.8 mg. of barbituric acid esters recovered per 100 gm. of brain tissue. The stomach contents weighed 295 gm., including 50 gm. of a green, shiny substance containing a high value of barbiturates. Assuming all of these facts, have you an opinion, based on reasonable certainty, as to the approximate number of 2 gr. Ethobral capsules that decedent must have ingested to have 2.8 mg. of barbituric acid esters per 100 gm. of brain tissue?"

The answer was, "Yes."

He then explained: "One has to estimate the amount of barbiturate that would be present if the whole body were available for analysis, and with the assumption that the extract was 100 per cent. When an extract like that is done, the toxicologist doesn't get it all out.

(Continued on page A-68)

*Schroeder v. The Manhattan Life Insurance Company, docket No. 639-56, U. S. D. C. N. J.

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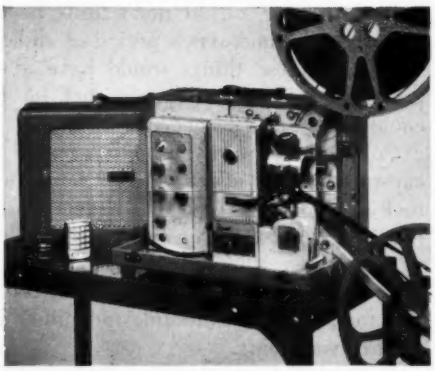

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It is very difficult to get all of the barbiturate out, so if 2.8 mg. was recovered in 100 gm. of brain and the man weighed 180 lb., and if you consider that the barbiturate is not evenly distributed in the organs, and to be on the conservative side you assume that the concentration found in the brain represents an average of a concentration of half the body weight, in other words, discount half the body weight to provide for those tissues which do not have the same concentration as the brain would have, thereby reducing the body weight to 90 lb., and with a finding of 2.8 mg. per 100 gm. of brain, it is my opinion that there would be 17 gr., but that does not take into consideration the amount of barbiturate that would be destroyed in the body.

"We know that one of these component parts, secobarbital, is very rapidly destroyed, so that what is found is more likely to be the least rapidly destroyed substance, such as the phenobarbital and butabarbital. If you consider that you can't—that some of it has been destroyed, that you don't get 100 per cent recovery, you have to add to that 17 gr., and then you also added the amount in the stomach, which I didn't consider in this calculation; that would make it even more. So the most conservative estimate would be 17 gr. Add to that what was destroyed by the body after ingestion, the amount that could not be extracted, and the amount in the stomach, and you will come up with an amount considerably more than 17 gr. It would not be an overstatement to say that the total amount in that body might be nearer 30 gr. I would say that at least 30 gr. was ingested.

"I think if the body could be completely analyzed, and we could consider the amount in all the tissues, since the extraction wasn't 100 per cent complete, the result would be well over 20 gr. If we calculated merely on the basis of half the body weight, and 2.8 mg. in 100 gm. of brain, then 17 gr. will be the minimum; but it can't represent the whole amount."

Dr. Helpern was then asked if he could convert his findings into the number of 2 gr. Ethobral capsules taken. His answer was that it would range between 8½ and 16 capsules.

Defense counsel, having produced this evidence, then sought to show that it was not probable for a person to take 8½ to 16 of the 2 gr. capsules of Ethobral one at a time over a period of several hours. An objection was made to an appropriate question, and in overruling the objection the court said: "But as I understand the theory of the defense, it is that, by reason of the potency of this type of barbiturate, the immediacy of the action of secobarbital coupled with the holding effect, for want of a better term, of one of the other constituents of the pill, that after the ingestion of one or more in a series, the effect will be such that the individual could not continue to take more."

Dr. Helpern then expressed this opinion: "In my opinion, that would be impossible in this particular case, because had this person taken these pills or capsules one at a time over a prolonged period, the effect would prevent any accumulation of barbiturate in the system with a value of 2.8 mg. . . .

"So I would say that the results here completely nullify and prevent any such interpretation. The only conclusion, the only reasonable conclusion, you can come to is that this man ingested many of these capsules at one time in order to build up this concentration in his brain at the time of his death."

On cross-examination, his opinion increased in strength.

". . . He could take one at a time within a very short time. . . . I don't think he could take one at a time over a period of an hour. I think that these things would have a sleep-producing effect on him so that he never could build up that concentration.

". . . In other words, if he took one of these capsules and the effect wore off, and then he took another capsule and the effect wore off, he never could build up this concentration.

"Now then, you want me to assume that after he took the first capsule he got confused and took a whole bottleful, and didn't know what he was doing."

QUESTION: Could that have happened?

ANSWER: If it happened, I would not say it happened in the nature of his not knowing

(Continued on page A-70)

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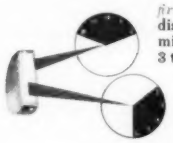

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what he was doing. I think anyone who is using these pills all the time knows what he is doing when he is taking them, and I base that on experience of having gone through cases of this sort. The whole trouble with the theory in which you take one and then you forget, and an hour later you take another is that it is not consistent with the concentration you build up, and just by the same token to assume that because he is taking another one, he is going to take 15 or 16, it would be highly improbable.

QUESTION: You may differ with that theory, Doctor, but it is a theory of medical men, also, that they can be taken one at a time, and the person loses count, doesn't realize he has had several of these pills, and may take a lethal dose; isn't that so?

ANSWER: He may lose count, but he would never lose it to the point of building up 2.8 mg. concentration in the brain. In other words, what I am trying to say—let's assume that a man is taking pills carelessly; he takes one and a half-hour later he takes another, in a half hour he takes another, and he is overdosing himself. He will go to sleep.

In addition to finding 2.8 mg. per 100 gm. of brain tissue, 50 gm. of a green, shiny substance was found in the stomach contents. This was probably the partly dissolved colored gelatin capsules in which the drug was dispensed. When a person dies soon after taking the drug, a large quantity recovered from the stomach contents and viscera would substantiate a finding of suicide if the possibility of homicidal poisoning can be eliminated.

"A small amount of the drug may be recovered from the tissues when a person lives two days or more. This fact does not mean that a small amount was ingested. If the survival period is longer, over two days, the amount of barbiturate in the stomach and parenchymatous organs will be much less, as much of the drug will have been excreted or destroyed. The period of survival must always be considered in appraising the result of the toxicologic examination, and investigation of the circumstances of the poisoning is necessary for the classification of the case. . . . In determining what amounts are significant, all due consideration must be given to the period of survival after the poison has been taken. In some cases the victim may survive long enough for almost all the barbiturate to be eliminated and death occurs from exhaustion or bronchopneumonia."[18]

In any case in which the evidence shows that the deceased took an unknown number of barbiturate tablets, each containing a therapeutic dose, regained consciousness, and then made a statement that he took two or three tablets and had no memory of taking any more, medical evidence should be introduced to show that sleep would have been induced long before the decedent could have taken a lethal dose. Such testimony should overcome any such statement imputed to the deceased that he took an overdose accidentally.

The following suggestions may be helpful in the defense of a suicide case in which barbiturates caused the death and automatism has been hinted by plaintiff's counsel.

1. The court should be requested to instruct counsel for the beneficiary not to discuss the subject of automatism in his opening remarks to the jury.

2. Any attempt to introduce opinion evidence relating to automatism, when there is no basis in fact for it, should be met with the objection (a) that there is no foundation in the proof in the case for it, and (b) that such evidence is irrelevant, speculative and uncertain medically. On proper objection, courts should not permit its introduction on cross-examination of the insurer's medical witness under the flimsy guise of testing his knowledge on the general subject of barbiturates.

3. Testimony that decedent made a statement on regaining consciousness may only be admitted as an exception to the hearsay rule.* A statement such as, "I only remember taking

*This paper is not the place to discuss exceptions to the hearsay rule generally, but see Seligman, An exception to the hearsay rule, 26 Harv. L. Rev. 146; Hinton, States of mind and the hearsay rule, 1 Chic. L. Rev. 394; Hutchins and Slesinger, State of mind to prove an act, 38 Yale L. J. 283; Morgan, A suggested classification of utterances admissible as res gestae, 31 Yale L. J. 229; McCormick on Evidence, chap. 30; Res gestae, 163 A. L. R. 15.

(Continued on page A-72)

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two tablets," should be held to be inadmissible under the exception to the hearsay rule relating to statements uttered under stress of excitement produced by a startling event, made before declarant had time to reflect or invent. A patient regaining consciousness in a hospital ward might readily exclaim, "Where am I?" and on being told exclaim, "I wanted to die." But a statement relating to memory of a fact would be elicited only by questioning by a physician or other questioning on the general subject of, "Why did you do it?"* It is also doubtful that a declaration as to the memory in explanation of previous conduct would be admissible as an exception to the hearsay rule, particularly when the statement would tend to be exculpatory of any questionable conduct.†

Statements imputed to decedent are frequently given by persons financially interested in the outcome of the lawsuit. It is easy to fabricate or color testimony which lies almost wholly in the control of the person who is producing it.

Conclusion

1. When a large concentration of barbiturates is found in the tissues, it is abundantly clear that the deceased did not take the pills one at a time over a prolonged period. A large concentration of the drug in the tissues implies the ingestion of many pills at one time.

If a person took a therapeutic dose and in 5 or 10 minutes took another and five minutes later still another, the drug would induce sleep and a large concentration could not be built up.

2. The recovery of a small amount of the drug from the tissues when the victim survives two days or more does not suggest that a small amount was ingested.

3. The marked similarity of the esoteric discussion of Richards' conclusions is cogent proof that the information is being passed along from one writer to the next without careful consideration of the original material or its source. To affirm the soundness of Richards' conclusions on the meager evidence of his three cases is an appeal to credulity which ought not to be attempted in an intelligent society.

*Wigmore on Evidence, Secs. 1745-1747; Trouser Corporation v. Goodman & Theise, 153 F. 2d 284, 287; Allen v. Mack, 345 Pa. 407, 28 A. 2d 783.

†In will cases declarations of testator to show his previous acts have been admitted. Gilliland v. Dobbs, 234 Ala. 364, 174 So. 784; Eder's estate, 94 Colo. 173, 29 P. 2d 631; In re Roeder's estate, 44 N. M. 429, 103 P. 2d 631. Contra, Boyle v. Meeker, 28 N. J. L. 270.

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Radiology FOR PRACTICING PHYSICIANS

Beautiful Island

CERTAIN MEDICAL AND OTHER ASPECTS OF FORMOSA

PAUL C. HODGES*

This is the first of a series of reports by Dr. Hodges relating to his recently completed six month (February through July) stay in Taiwan where he served as China Medical Board visiting professor of radiology to the National Defense Medical Center.

A HUNDRED years after Columbus reached America, Portuguese navigators on the other side of the world came upon a tropical island of such great physical beauty that they called it Formosa, which, in Portuguese, means beautiful. Adventurous Chinese had begun landing on Formosa at least as early as the fifth century, and by 1622 they are believed to have numbered approximately 100,000. In 1624 the Dutch established settlements and were able to maintain them for 37 years before being driven out by refugee Ming dynasty forces fleeing from the mainland by way of Kinmen (Quemoy) to escape the wrath of the Manchus. Twenty years later the Manchus took over, and under the name Taiwan the island became one of the most progressive parts of the Empire, acquiring provincial status in 1886.

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In 1895, following the disastrous Sino-Japanese war, China was obliged to cede the island to Japan, but the inhabitants, refusing to accept the decision, revolted and attempted to establish a republic. Japanese retaliation was so prompt and drastic that, except for the first few months, there was little armed Chinese resistance; but the aborigines remained recalcitrant throughout the 50 years of Japanese rule, making sporadic bloody forays against gendarmes detailed to confine them to their mountain fastnesses, followed invariably by even bloodier Japanese reprisals. In 1945, Japan returned the island to China; and in December 1949, following the Communist conquest of the mainland, a refugee army and civilian group, repeating in a way the events of 1661, fled to Taiwan from Shanghai and other ports and established there the government of Free China. Today the nonwestern population exceeds 10,000,000, of whom

roughly 150,000 are aborigines, 8,000,000 Taiwanese and 2,000,000 mainlanders. The latter two terms are in common use, but both groups are Chinese and could better be termed "old-timers" and "newcomers."[1-3]

In addition to about 4000 other non-Chinese, approximately 10,000 Americans live in Taiwan, and because there is a rapid turnover, it follows that many thousands of our fellow countrymen have known the island as a home. Almost all of them, however, are in our armed services or other governmental agencies and, on leaving the island, move on to other overseas posts. Until Mr. Eisenhower's visit this year (figure 1), few ordinary American citizens gave much thought to the place, except as it came into the news from time to time. That certainly was my situation up to a few months before I flew from New York on February 3, 1960, to serve for half a year as China Medical Board visiting professor of radiology to the National Defense Medical Center located in Taipei, the capital of Taiwan.

Our seafaring forefathers knew Formosa as a mountainous tropical island lying 100 mi. off the South China coast, a little less than 100 mi. wide and something over 250 mi. long, with the Tropic of Cancer bisecting it into almost equal northern and southern portions. Their sailing vessels called at the northern port of Chilung for tea and took care to avoid the shoals off the tip of the "Beak of the Goose" (figure 2) at the extreme south where, a century ago, a lighthouse was erected as a memorial to shipwrecked American sailors murdered by head-hunting aborigines. The lighthouse still functions, but the aborigines (figure 3), comprising several tribes in various sections of the mountains, are adapting to the twentieth century so rapidly that anthropologists are feverishly gathering data on the details of their colorful Stone Age culture (figure 4) before it has vanished.[4,5]

At other times I intend to write of radiology and medical education in China and of a unique American Medical Research Laboratory in Taipei. If my present article is short on medicine and long on geography, economy, agriculture and military and other governmental matters, let my excuse be that here in China and in the tropics one is always close to the soil, to toil and to human relations, and that these matters are interwoven with medicine to a greater extent here than they are in America.

American Aid

No account of anything in this part of the world is comprehensible without some mention of the policies and actions of our own government, but I use the word "mention" advisedly, because more than that would exceed my competence and require far too much space. The following facts are matters of public record.

During the Chungking phase of the Nationalist government we exerted pressure on the Generalissimo to incorporate the Communists into his government and his armies. On January 5, 1950, when many believed that Taiwan was about to be overwhelmed by the Communists, President Truman announced publicly that no American assistance would be forthcoming to resist the anticipated attack, but six months later the events in Korea caused him to modify his position and declare that we would defend Taiwan and aid Free China to defend itself. He added the warning, however, that the Nationalist government must not use Taiwan as a base for attack against the Communist mainland, a restriction which his detractors believe freed hordes of Red soldiers for deployment in Korea.

On February 2, 1953, President Eisenhower canceled the "no attack" restriction; on January 29, 1955, the Congress authorized the President to defend Formosa even at the risk of war; and on March 3, 1955, our two governments signed a national security pact.[6-8]

From my worm's-eye view, the mutual security pact is working extremely well in spite of enormous differences in temperament and cultural background, and it works well because of the frank admission that we need their assistance as badly as they need ours. Except during joint maneuvers such as the "Blue Star" operation this spring, one sees little of our Seventh Fleet, but is constantly reminded of its comforting nearness and strength. Our army, air force and civilian per-

sonnel serving as technical advisers appear to me to be admirably chosen from the standpoint of ability and tactful personality, and our guiding policy is emphasized by the advice beamed to Americans by our Armed Forces Broadcasting Station along with music and news. These announcements stress our status as guests, the usefulness of a knowledge of the Chinese language, and the importance of deportment that will reflect credit on America.

Through the kindness of Mr. Richard M. McCarthy, director, and Mr. Charles W. Bergstrom, information officer, of the USIS (United States Information Service), I have been supplied with the recently released statement on our International Cooperation Administration (ICA) Aid Program for the fiscal year closing June 30, 1960. Direct military assistance is financed by our Department of Defense, and quite properly the details and amounts are not published. Public addresses by various informed Americans, including the President himself, the morning paper, and what one sees and hears make it clear, however, that the amount is large and the results gratifying. In addition, Free China participates in the Development Loan Fund, along with several other countries. ICA aid specifically for Taiwan amounted to U. S. $70,400,000 in the fiscal year 1960, by far the larger portion going into what is called defense support, with $2,400,000 devoted to technical cooperation. The former, as the name indicates, is closely related to military assistance, and it is the latter which, among many other things, includes in its scope education and health.

Because I have been their teacher and colleague, some scores of Chinese physicians with whom I lived, worked and traveled accepted me as one of themselves, and frequently I was the only non-Chinese present at formal and informal meetings, conferences and social gatherings. I do not delude myself that there was no reserve whatever, because that is even more unthinkable in China than it would be in the West; but I am sure they took me into their confidence far more than they would if I held a government post and lacked the old Peking connection. Among these Chinese friends there is universal admiration for our Ambassador's administration of his office, and this is heightened by appreciation of his command of the language and of the energetic participation in public affairs by his beautiful and talented wife.

Of the many other members of our military and civilian staff with whom they deal, they have only the kindest things to say; and if I myself tend to single out as particularly fortunate selections Lieutenant Colonel J. J. Zurcher of our Military Assistance Advisory Group staff, Dr. Robert L. Cherry, chief of the Public Health Division of ICA (figure 5) and Captain R. A. Phillips, MC, USN, commanding officer of NAMRU-2 (Naval Medical Research Unit No. 2), it is only because my work has happened to bring me closer to them than to their associates in these or other American agencies in Taiwan.

Medical Background

China's ancient intellectual heritage justified, at least to some extent, its scholars' conviction that the "Central Kingdom" was an island of erudition in a sea of barbarism.[9-11] However, those scholars were concerned almost exclusively with what we call the humanities, and for the most part science remained outside the fold for some five centuries after the universities of Europe had admitted it as a legitimate pursuit for learned men. The scholars of an earlier China contributed almost nothing to the development of such disciplines as anatomy, physiology and surgery; and although present-day Chinese physicians are making increasingly numerous and important contributions to medicine, it is only fair to point out that this is a development of recent years and that well into the present century China's medical research, teaching and practice looked abroad for much of its leadership. In Taiwan that leadership was supplied by Japanese; in Shanghai, Hong Kong and other port cities by British, French, Germans and Americans; and throughout the nation by medical missionaries of various nationalities and faiths.

If I were to attempt to mention, much less

analyze, the work of even those pioneer British, Americans and Chinese whom I have known, too much space would be required and injustice would be done to scores of others not personally known to me. I shall speak, therefore, only of the one who to my mind typifies the best. I refer to Dr. J. H. Liu (figure 6), who today, at the age of 70 and in poor health, lives in retirement in New York.[12] B. S. Harvard University 1909, M.D. Harvard Medical School 1913, and surgical resident at the Boston City Hospital for two years following graduation, Dr. Liu returned to China in 1915 and was serving as surgeon and surgical pathologist at the Harvard Medical School in Shanghai when I arrived there in the early fall of 1915 to teach physiology. When, after World War I, I returned to China, this time to Peking, we were colleagues again at the Peking Union Medical College (PUMC), where he was one of the senior surgeons and eventually became hospital superintendent, minister of health and surgeon general of the Chinese army. I am never surprised at evidence of Dr. Liu's versatility, because my late wife, our eldest child and I owed one life, and probably two, to his ability to translate surgical sense into obstetric deftness in the early days of the PUMC, before the professional obstetricians had arrived. Much that is good in Free China's medicine in 1960 stems from Dr. Liu's keen intelligence, vision and industry before, during and after the days of his ministry.

Medicine Today

Taiwan's physicians include many who combine personal ability with adequate training, professional competence being particularly obvious in the medical, surgical and public health phases of tuberculosis, a disease which has been and continues to be a major problem.[13] In time most of them will be graduates of local medical schools, which at present number three and turn out a total of something over 200 a year; but of the present-day Chinese physicians, many were educated in Japanese schools in Japanese-held Formosa or Japan proper, in Europe, America or the pre-Communist mainland. As a former faculty member of the Peking Union Medical College, which was established by the Rockefeller Foundation 20 years ago and operated until it was seized by the Reds, it is gratifying to me that graduates of that institution together with first and second generation products of their teaching are among the nation's ablest and most influential physicians.

In 1960, the total number of qualified physicians in Taiwan is approximately 6700,[14] with midwives and nurses bringing the total of medical personnel to approximately 11,000. A spot map shows hospitals, clinics and health stations of various sorts peppering the island from one end to the other and, as I have said, the population served exceeds 10,000,000. A medical program of this magnitude is not adequately discussed in less than thousands of words, but the best I can do is to turn now to notes made during a 10 day trip in March 1960, during the course of which I reached all of the principal cities and visited 27 representative hospitals, clinics and health stations. Since I intend to deal elsewhere with Taiwan's radiology and its medical educational facilities, I shall speak here largely of other aspects of medicine and hope it will be remembered that space limits me to a mere synopsis of what I saw and heard.

Trip Around the Island

My friend, companion, courier and mentor was one of China's best-known and best-loved physicians, Professor James O. K. Khaw, better known as "O. K." (figure 7). Formerly chairman of the department of parasitology at the PUMC, formerly a general in the medical corps in the Chinese army, a veteran of the Burma campaign of World War II and a generation earlier of the campaign in Mesopotamia, O. K. currently is head of the department of medical biomorphics at the NDMC.

Taiwan's mountains are so extensive and so high and influence so profoundly the agriculture and transportation of the island that I wish it were possible for the reader to have before him the splendid relief map prepared by the China Map Service Survey Department of the Chinese armed services. Let us hope that its reproduction (figure 8) and the key

figure 9)* will provide a fair understanding of the situation. High, forest-clad mountains form a broad backbone through the length of the island, falling precipitously to great ocean depths on the Pacific side and on the western side fading out gradually into an agricultural plain approximately 9 mi. wide at the narrowest point in the north and approximately 30 mi. wide at the widest point in the south. For about 90 mi. along the central portion of the Pacific side a deep trenchlike valley, 5 or 6 mi. inland from the sea, separates a moderately high coastal range from a much higher central range and is occupied by river beds, railroad tracks, and some highways.

Until recently cross-island traffic, except at the extreme north and extreme south, has been in part precarious and in part impossible, and the recently completed east-west highway from Taichung(21) on the west to Hualien(7) on the east has only now been opened to traffic. Through the kindness of Captain Phillips of NAMRU-2, we left Taipei(1) early on the morning of March 18, 1960, riding in a U. S. Navy convoy bound for Hualien to collect specimens for the department of parasitology. Headed east during the first hour out of Taipei, we traveled mountain roads through rain and fog, but encountered clearer weather as we dropped down onto the Pacific plain at Chiaohsi(2). Skirting the coast we came to Ilan(3), a tiny port, and Suao(4), which is the entrance to a one-way highway. While the convoy waited there for the hour when southbound traffic could move, we visited the fishing village of Nanfangao(5), an important Japanese submarine base during the war.

East Coast

South of Suao for many miles the road clings to or bores through cliffs which drop away hundreds of feet to the sea below, the scenery being as fine as on the more picturesque portions of our own Pacific Coast and Italy's famed Amalfi Drive (figure 10). Only at occasional villages like Nanao(6), where the road dips to cross flood plain at the mouths of mountain streams, is traffic allowed to stop, and then only briefly, because it is important to get on to the end of the one-way portion before it is time for traffic to move in the opposite direction. It is easy to see why there have been tragic accidents to private cars and public buses, but our navy cars were in good condition and their drivers cautious and competent, and without incident we reached Hualien nine hours after leaving Taipei. Even in Hualien we continued for two days to enjoy the navy's hospitality because, since some of the members of their party were still to come, space was available in the MAAG Hostel, where we were quartered comfortably and economically. In Hualien also we made first contact with the openhanded hospitality of the Chinese Army Medical Corps and numerous agencies of the Taiwan Provincial Health Administration, including tuberculosis stations, provincial hospitals, the Malaria Research Institute, the Maternal and Child Health Welfare Center, and the Kaohsiung Medical College. It would be possible for one to make the trip around the island entirely without the assistance of friends, but he would do so with much less speed and comfort than we experienced. I am indebted to the directors and staff of all the institutions concerned and particularly to three friends in Taipei, Dr. Yang Wen-ta (figure 6), surgeon general of the Chinese army, Dr. C. H. Yen (figure 11), commissioner of the Provincial Health Administration, and Dr. H. T. Lin, of the Tuberculosis Control Organization.

After inspecting the Hualien Provincial Hospital, the Fifty-first Army Hospital and the Fifty-eighth Army Hospital, we visited the wharf where the principal commodities seemed to be cement, fertilizer and cypress logs (figures 12 to 14) and then, at 8:10 on a beautiful Sunday morning, boarded a neat two-car diesel train for the four hour trip to Taitung(8) over a roadbed that lies in the trench between the coastal and central ranges. The weather was balmy and the countryside beautiful. Here and there small boys fished in streams, and everywhere men and women worked in their fields of rice (figure 15), sweet potatoes, pineapple and sugar cane. The cane was in every stage of develop-

*Numerals in parentheses designate points on map.

FIGURE 1. Taipei went wild over the President's visit. I do not doubt the local government's ability to whip up a welcome if necessary, but this one was spontaneous; and men, women and children started out shortly after sunrise to be assured of a place from which to watch the show.

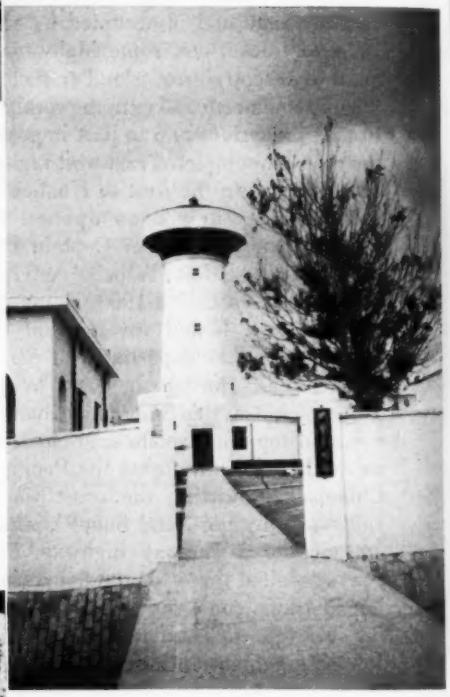

FIGURE 2. Lighthouse at Oluanpi ("Beak of the Goose"). Erected a century ago near the site of the murder of shipwrecked American sailors by head-hunting aborigines, the modernized light is in regular use.

FIGURE 3. Aborigines at Sun Moon Lake. The aborigines vary widely in the extent to which they have adopted modern ways. Posed with me here are Chieftain H. S. Mao and his princess daughters, old friends of O. K.'s, who speak Mandarin and dress conventionally except when they are entertaining visitors to their village on Sun Moon Lake.

FIGURE 4. Aborigine village on road above Puli. It is not mere accident that this ancient-type aborigine village is convenient to tourists traveling into the mountains above Puli, but I am assured that there are many others deep in the mountains where no other way of life is known.

FIGURE 5. Dr. Robert L. Cherry, chief of the Public Health Division of ICA, Taipei, Taiwan.

FIGURE 6. Dr. J. H. Liu (retired), *right*, former Minister of Health, and Dr. Yang Wen-tah, currently surgeon general of the Chinese army on Kinmen (Quemoy).

Photograph reproduced courtesy American Bureau for Medical Aid to China, Inc.

FIGURE 7. Professor James O. K. Khaw (*right*), NDMC, and J. Y. Peng, at entrance to Dr. Peng's Maternal and Child Health Institute in Taichung.

ment, from that of just sprouting to fully ripened cane waiting for the knife to trainloads of harvested cane on their way to the sugar factories. Pineapple is a cash crop that goes in on newly cleared land, and we saw it not only close to the right of way but also on terraced fields extending far up on the hillside. Now and then we passed through tunnels and occasionally passed loading platforms of the narrow-gauge railroads that carry sugar cane to the mills and bring great cypress logs down from the mountains. In many of the rice fields, we saw flocks of white egrets, which O. K. tells me may be important reservoirs of poliomyelitis virus, and occasionally fields gave way to forests or to stands of tree ferns; palms; betel palms; bamboo; banana, papaya, guava and mango trees and cardamom and derris plants. Rotenone is made from the latter. Most colorful of all these at this time of the year is the kapok or "Flame of the Forest," not yet leafed out but with unbelievably beautiful orange blossoms. In Taitung we inspected the Provincial Hospital and Health Center, and in the late afternoon our friends drove us to a nearby hot-springs resort, Chihpen[9], and after baths brought us back for dinner at a restaurant.

West Coast

Next morning at 9 o'clock we started south again, this time by bus, through tropical countryside cooled by a steady breeze from off the Pacific, and after an hour and a half made a 10 minute stop at Tawu[10], at which point the road turns west and climbs the mountains to the west coast village of Fengkang[11]. At Fengkang we found a Ford station wagon and driver, sent south for us by Dr. W. I. Chen, director of the Malaria Control Research Institute at Pingtung[16]. As a result of this thoughtfulness we were able to negotiate the southern tip of the island, which is short on public transportation at best and particularly at this time because of large-scale joint maneuvers between American and Chinese naval, marine and army forces.

After checking in at the hot-springs hostel at Ssuchunghsi[12], we drove south through the walled city of Hengchun[13], past a whaling station to the lighthouse at "Beak of the Goose" (Oluanpi)[14], then back past our hostel into the mountains to Shihmen[15]. A monument there marks the site of one of the more sanguine encounters between aborigines and Japanese and beyond it are a tiny health station designed to meet the simpler health needs of the mountain people and a school for their children.

On the morning of the fifth day, headed north along the shore of the west coast, we passed dozens of naval vessels anchored or moving about in the Straits of Formosa. But about 10 km. above Fengkang[11] we came to the end of the "Blue Star" operation. Of the several stops before Kao-Hsiung[17], the most notable was at the provincial Malaria Research Institute at Pingtung[16]. Like some other low-lying areas in Taiwan, the river basin at Pingtung long had been notorious

FIGURE 8. Relief map of Taiwan prepared by China Map Service Survey. I have designated by numbers 1 to 28 cities and other places mentioned in the text.

FIGURE 9. Key to numbers shown on figure 8. Courtesy C. E. Knight, HMCS, USN, a member of the NAMRU-2 staff.

for its lethal fevers, which eventually were recognized as predominantly malarial.[15] The Japanese undertook malaria control in self-defense if for no other reason, but, although fair headway had been made, ground was lost during the shortages and preoccupations of World War II, and in 1946 the clinical incidence of malaria was 1,200,000 cases annually. Following the Japanese surrender, the Malaria Institute was established and for a brief period supported by Rockefeller money and then shortly became an activity of the Provincial Health Administration. By 1956, *Anopheles* control had brought the annual incidence down to 486,[16] and the present annual rate is 102. The director, Dr. W. I. Chen, the vice-director, Dr. Y. T. Wu, and their associates conduct continuous mapping of the incidence of 16 varieties of *Anopheles* (*A. minimus* is the chief but perhaps not the sole vector) and modify their program of spraying homes and animal shelters on the basis of their mapping. In 1952, blood smears were positive in 10 per cent of school children, but today out of 700,000 smears from subjects of all ages only 0.02 of 1 per cent are positive, and recently there were no positives in 15,000 consecutive smears from school children. Many thousands of acres of rich land formerly unusable because of the risk of malaria now are prosperous farms.

On the evening of the fifth day we arrived at Kao-Hsiung(17), sent the borrowed car back to the Malaria Institute and for our visits to hospitals, clinics and the Takau Medical College were supplied transportation by friends. I shall speak of Takau at another time.

The evening of the sixth day found us in Tainan(18) following a train ride from Kao-Hsiung. The next morning Dr. T. L. Su, director of the Tuberculosis Center in Tainan, took us first to see the two principal temples and then to his institute which impressed us as being among the best we have seen. Most of the x-ray examinations are on microfilms and in addition to the unit in the center, two mobile units spend five days out of the week in the field making a total of 3000 microfilms a week. This center administers BCG vaccine to children, conducts drug therapy on an out-

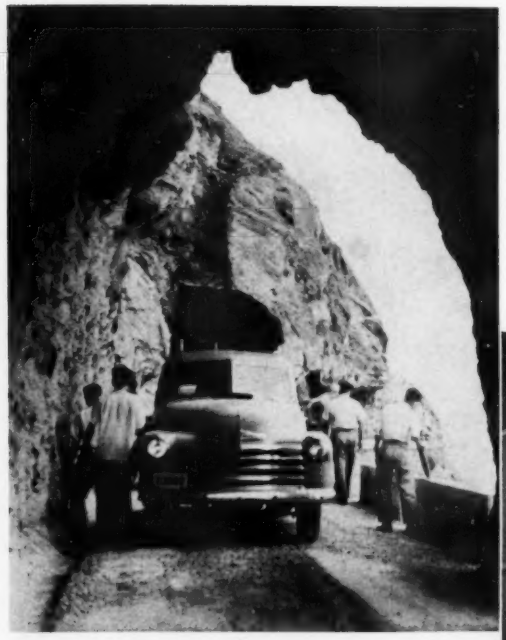

FIGURE 10. Pacific Coast Highway from Suao to Hualien. The road clings to, bites into and at times bores through rock cliffs, and is too narrow for two-way traffic. We made our trip with our navy convoy near the middle of a long line of other vehicles and could not have stopped to make photographs even if weather had permitted. Commander Kuntz, to whom I am indebted for this photograph, had the foresight to place his convoy at the end of the line and the good fortune to make his trip on a clear day.

FIGURE 11. Dr. C. H. Yen, the Provincial Commissioner of Health Administration.

FIGURE 12. Water buffalo hauling cypress at Hualien. Most bullock carts employ humped cattle, and the buffalo's more common task is plowing rice paddies. On highways both animals wear straw sandals, and the carts invariably have rubber tires.

FIGURE 13. Pedicab truck in Taipei. A decade ago the pedicab replaced the ricksha for hauling passengers. For moving goods, it and the bullock cart far outnumber motorized trucks.

FIGURE 14. "Ice wagon." To a boy of my era a bicycle, particularly if battered, was an "ice wagon." The term is literally applicable in Taipei. Most ice moves by pedicab truck, but frequently one sees bicycle loads much larger than this not only of ice, but of such commodities as livestock, dozens of bottles of Chinese sauce, coal, cement, rice, plumbing fixtures and lumber.

FIGURE 15. Harvesting and threshing rice near Taipei. Three crops a year in the south and two in the north are set out by hand from seedling beds, weeded, sickled and bundled by hand, and threshed in a simple foot-powered thresher. Drying, sacking and carting are done by primitive methods; but polishing, formerly done in the rice shops with padded wooden pestles and stone mortars, now is done by power-driven machines.

patient department basis, and arranges hospitalization and surgery for those who need them. It has handled 2,607 cases of open tuberculosis in the past three years. In all the nation the annual mortality rate from tuberculosis has been reduced from 200 per hundred thousand to 68 per hundred thousand. The vigorous control program brings into the island's hospitals so many tuberculous patients requiring intensive medical management or thoracic surgery that the casual visitor mistakenly assumes a nationwide incidence even larger than the mortality rates suggest.

One of the best of the Chinese army hospitals is the Tainan Fourth General Hospital, commanded by General W. Y. Chiang. Six years ago, Dr. Richard K. Blaisdell was stationed there while serving as a medical officer in the U. S. Army, and a pathology laboratory and medical library established by him continue to flourish.

On the seventh night out of Taipei, we were guests of the Taiwan Sugar Corporation at their yeast factory in Hsinying[19], which we reached at dusk by train from Tainan and pedicab from the station. A modern, highly automated plant (twice the size of any other in the world), employing molasses as a base and special yeast cultures obtained in Peoria, Illinois, works around the clock producing every 24 hours 40 tons of dry yeast that has an unusually high protein content. It had been hoped that the Chinese people would accept such yeast as a welcome supplement to their protein-deficient diets. But the idea did not take and the product has to be marketed as stock feed. On the morning of March 25 (eighth day), Dr. H. W. Luan, director of the tuberculosis center in Chiayi[20], sent his associate, Dr. Hsu, to take us north past the Tropic of Cancer monument to Chiayi. After we had visited the center there and the Veterans and the Provincial Hospitals, Dr. Luan himself took us to Wufeng Temple and then to the bus station to board the "Golden Horse" bus for Taichung[21].

Saturday morning, March 26, saw us at the Maternal and Child Health Institute in Taichung,[17,18] the Provincial Hospital, the Third General Army Hospital, and the Air Force Hospital, and early in the afternoon in a jeep station wagon loaned by Dr. J. Y. Peng, director of the Maternal and Child Health Institute, we started through rain to the suburbs to spend an hour enjoying the current showing of a small portion of the paintings, porcelains, bronzes and other treasures belonging to the National Palace Museum and the National Central Museum.[10,11] Beyond the museum, the road became mountainous and because of road-making and heavy rains all but impossible, but we did get through at last to Sun Moon Lake[23]. Named because of a supposed resemblance of its rounded and crescentic portions to the round sun and the crescent moon, Sun Moon Lake is one of Taiwan's best-known beauty spots. It lies high in the mountains, serves as an important hydroelectric reservoir, and has a large, comfortable hotel, The Evergreen Hostel. We spent Saturday and Sunday nights at the hostel and, with it as a base, on Sunday continued up the mountain through Puli[24] to Wushe[25], which at that time was the terminus of the road. Just below Wushe, there is another monument commemorating Japanese gendarmes killed by aborigines, and aborigine men, women and children killed in reprisal by the Japanese, and in the village itself there is a tiny health station staffed by one doctor.[19]

On the morning of Monday, March 28 (the eleventh day out of Taipei), we toured the lake by motorboat, including a visit to an aborigine village, and then drove to Taichung by way of Wufeng[22], the provincial capital. After a brief visit there, we boarded the train at Taichung for Taipei passing en route Hsinchu[26], which had been visited the previous month by automobile from Taipei. Hsinchu is the site of Tsing Hua University, where a nuclear reactor is under construction, and of numerous factories, including one that manufactures window glass, some of which is sold in the United States. Chilung[27], not included in the trip but visited by me on several other occasions, is the island's principal seaport. Taroko Gorge[28], named for an aborigine tribe, is high in the mountains near the eastern end of the newly constructed highway from Hualien[7] to Chilung[27] and by all

accounts is well worth a visit. My two attempts failed, however, first because of construction work at the Pacific end of the road and two months later by torrential rains which triggered landslides west of the gorge.

The Chinese military and civilian hospitals and clinics in Taipei, as well as those of mission societies and our armed forces, deserve more than this mere mention, and some of them will be described at another time.

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PSYCHOSOMATIC MEDICINE—*First of a Series*

The Medical Interview

FRANCIS H. HOFFMAN* AND WILLIAM A. STEIGER†

Temple University Medical Center, Philadelphia

Introductory Comment

From their combined years of rich clinical and teaching experience, Drs. Hoffman and Steiger have distilled the essence of the "patient-oriented" diagnostic approach and have phrased it in terms of nine cardinal "rules" of personal interviewing. The rules themselves very nearly guarantee a meaningful history, and one which can be acquired rapidly and efficiently by the busy physician. The true message here, however, lies in the attitude toward understanding patients which will develop in the doctor who interviews with focus on the patient's frame of reference, rather than his own. The prescribed treatment is effective only if it receives the patient's confidence and cooperation; explanations are meaningful only if they are understood; and reassurances are therapeutic only if they are accepted and believed. To assure these goals, the physician must know "who" his patient is.—Franklin G. Ebaugh, M.D.‡

FRANCIS H. HOFFMAN

WILLIAM A. STEIGER

It is generally agreed that the patient's history as obtained by a personal interview is the most effective diagnostic tool that a physician possesses. Today physicians are expected to deal with their patients comprehensively: to assess all their problems, whether psychologic, sociologic or biologic. It is an important aspect of comprehensive medicine to give equal value to each of these measurements of the patients' presenting complaints, since patients find it most acceptable to phrase a wide variety of problems in biologic terms. Because they do, a broader appreciation of what the historical investigation can reveal becomes increasingly important in this multidimensional rather than unitary evaluation.

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Until recently, little effort was made to identify and define the important elements of interviewing technic and to incorporate them into the instruction of future physicians. Without precise rules of interviewing procedure, the teaching of history-taking in medical schools was consequently focused almost exclusively on clarifying the circumstances surrounding the presenting complaint. The instruction in history-taking (interviewing) that was given usually consisted of the distribution of a rather rigid list of short questions concerned with the functioning of bodily systems and organs. This type of questioning was almost completely oriented to the discovery of biologic disease and has proved severely inadequate in assessing the patient's personality and his social and emotional problems. Much time was devoted to mastering the technic of physical diagnosis and to evaluating laboratory tests, while successful interviewing was largely self-taught.

Psychiatry, on the other hand, has the interview as almost its only tool of diagnosis (and treatment). It has therefore made a considerable effort to perfect interviewing technics, and some of its knowledge in this area is applicable in the general practice of medicine. It is beyond the scope of this article to discuss all of this material. The interested reader would find valuable and easy to read Bird's "Talking With Patients," Colby's "Primer for Psychotherapists," and Meares' "The Medical Interview."[1-3] It is our purpose here to emphasize several cardinal elements of interviewing which can be incorporated immediately into history-taking.

The art of interviewing is a complex of many skills. It includes the perception of verbal and nonverbal cues, the analysis of the feelings engendered in the doctor by the patient, an appreciation of the patient's level of intelligence, a feeling for his colloquialisms, etc. Following are some of the simpler rules of good history-taking that have proved valuable in our experience.

Rules for Interviewing

1. The use of the word "why"—The key question in gaining an understanding of patients is "why?" Why did the patient come, why did he come now, why did he say that, why does he think this, why does he feel this way? If a young married couple state that they are both diabetic and ask if they should have children, the alert physician inquires first "Why do you ask?" before he finds himself advising negatively only to learn that the wife is three months pregnant.

2. The physician should not assume that he understands what the patient means—Frequently when a social or emotional cause of the illness is being sought, the question "How are things at home?" is asked. If the patient replies, "Oh, everybody has some trouble, Doc," the physician may assume that he understands the meaning or lack of meaning of this and pass by the significant area of conflict. The doctor should not be satisfied with this type of answer but should encourage the patient to reveal his specific problems. This allows the physician, rather than the patient, to judge their significance for the illness.

3. What does the patient think is the cause of his disorder?—It is surprising how often this question will reveal the answer to a puzzling case. When first asked, the patient will often deny that he has any idea about the cause of his symptoms, or he may sarcastically reply, "That's why I came to you, Doctor." To the first response, a persistent "Have you no idea?" or "Most people have some thoughts on the matter" is indicated. In the latter case, tolerant good humor plus a wary appreciation that patients who act this way do not want to hear anything bad about themselves will often pay off. A 38 year old engineer complained of intermittent left-sided chest pain of three months' duration. After questions about the nature, location and severity of the pain, the patient was asked, "What do *you* think is the cause of the pain?" A long pause followed and finally the patient said, "Well, it all began right after the death of my father from a heart attack. My father and I were very close and everyone says that we are very much alike." Thus an important aspect of the patient's concern became evident, and appropriate exploration and later reassurance could be given.

1. What does the disease mean to the patient?—Asking this question allows the patient to reveal fantasies about his disorder. The physician may learn that the patient feels that the degenerative joint disease will be crippling, like Aunt Mary's arthritis, or that the cessation of menses means that the "poisons" have no way of getting out, and so on. A 46 year old white woman was told after examination that she was physically well and that her problems were emotional. She became extremely anxious and ran from the clinic. Her chart showed that her husband was a paranoid schizophrenic who had been confined to a mental hospital for two years where he received several courses of electroshock therapy. What "emotional" meant to this patient and why her anxiety was aroused were then readily apparent.

5. The doctor does not have to answer a patient's questions—In polite conversation, one generally feels obliged to answer another person's question. In medical interviewing, however, this is not necessary and most often should be avoided. The usual and most successful technic is to turn the question back to the patient, saying, "What do *you* think about this?" For example, occasionally the patient being questioned on emotional problems will suddenly ask, "Do you think I am crazy, Doctor?" This may fluster the interviewer and he may make a hasty denial when in reality he feels the patient is emotionally ill. It is usually wiser to answer with a question, such as "Have you been concerned about this?" or "Are there any reasons why I should think so?"

6. The interviewer should be aware of his own inhibitions about certain areas of questioning—Understandably, physicians often have some inhibitions about questioning in emotionally charged areas, particularly sexual ones. It takes courage to ask questions that patients may dislike or resent or that may uncover material the patient would rather hide. However, such questioning is often a necessary part of the physician's job, and, if he does it with equanimity, he will not stir up excessive anxiety in the patient. At times, preliminary questions such as "Do you mind if I ask some personal questions?" and an assurance that all material is confidential will allow for an easy transposition into sensitive areas. The rule "Do not try to explore or handle a patient's problem area which makes you uncomfortable" is a wise one, particularly if you cannot get support and help from a colleague, who is not necessarily more experienced than you are but who can tolerate the tension that investigation of this particular area creates.

7. Be aware of the connotations of the patient's words—A patient's chief complaint was that she could not eat meat. It was determined that this was not due to any swallowing difficulty—she just had an antipathy to meat. The skilled interviewer would entertain an immediate suspicion that this patient's problem might be emotional and closely connected with the sexual area, since "meat" is in vulgar expression a phallic symbol. In this particular case, the patient spontaneously proceeded to tell of her son's death, his sexual problems, and finally her own problems (frigidity and dyspareunia) in this area. Thus, as was suspected, the patient did indeed easily associate meat and sex.

There are, of course, innumerable such associations in people's minds. Some are as complex as that above, others are more evident. An awareness of the possible remote meaning of words, however, can save considerable time in interviewing.

8. Negatives equal positives, and the reverse is also true—Sometimes interviewers will accept negative statements or denials at face value. This can result in missing the significant material of the interview. A depressed patient admitted feeling very melancholy and then stated, "But I'd never commit suicide." This denial obviously indicates that the patient has been thinking of suicide, and it deserves careful evaluation as to the risk involved.

A male patient revealed that his symptoms occurred when his wife argued with him. At these times he would leave the house and go for a walk. When asked *why* he did this, his fists clenched and he stated, "Well, I wouldn't hit her or anything," thus revealing the actual extent of his anger.

The patient who says, "I love my children," but means, "They are brats and I sometimes wish I were free of them," needs help in exploring and discovering the limited and thus less fearful nature of these negative reactions to the children.

9. "Actions speak louder than words!"—Behavior is often more significant and meaningful than the words professed by the patient. A recent patient said that her husband and she were "very close." However, it was found that he works nights and she works days and they see each other once or twice each week. This did not appear "very close" to the doctor. Further inquiry revealed that the patient and her husband, both in their early 40s, had not had sexual relations for three years.

A patient who had fully recovered from a myocardial infarction was advised that he was well enough to use the stairs freely and to drive his car. On a recent visit, however, it was learned that he did neither, using the stairs only twice a day and having someone chauffeur him. When asked why, he replied, "Well, it's not because I'm afraid to die." His actions and his concern about dying clearly revealed his anxiety about the consequences of the myocardial infarction and deserve open discussion.

Summary

This article deals with some aids in history-taking that we believe can be of practical value to the practicing physician. Briefly, they consist of the following rules for interviewing: (1) The physician should frequently use the word "why." (2) The physician should not assume that he understands what the patient means; (3) he should inquire what the patient thinks is the cause of his disorder and (4) what the disease means to the patient. (5) The interviewer is not obliged to answer a patient's questions. (6) The interviewer should be aware of his inhibitions about certain areas of questioning. (7) He should be alert to the connotations of the patient's words. (8) Negatives equal positives. (9) "Actions speak louder than words." These rules were developed out of an effort to teach better technics of interviewing to our students and have proved of value to them and to us.

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***A Reminder* ---**

1960 Interstate Postgraduate Medical Assembly

Pittsburgh-Hilton Hotel

Pittsburgh, Pennsylvania

OCTOBER 31-NOVEMBER 3

Causes and Prevention of Deafness in Childhood

OSCAR CARP*

University of Nebraska College of Medicine, Omaha

Hearing problems in children must be diagnosed early in order to prevent deafness in later life.

Tests for determining deafness in children less than five years old should be conducted by trained personnel. Audiometric studies are usually reliable and valuable in testing hearing in older children.

A study of school children in Nebraska showed conduction deafness to be the most common type of hearing loss. Removal of obstructive tonsils and adenoids resulted in marked improvement in hearing.

Other types of hearing loss encountered in the study included perception and mixed-type deafness. One case of otosclerosis was observed.

THE early diagnosis of any hearing problem in a child is the first step toward preventing deafness in later life. A hearing problem in the very young is usually first noticed by the parents. The baby who has a congenital hearing loss fails to respond to ordinary auditory stimuli. The physician usually is asked to corroborate an opinion which most parents have formed by observing the child at home.

OSCAR CARP

Tests for Deafness

Tests for determining deafness in infants are still almost primitive and rudimentary. In most cases, deafness must be diagnosed by watching the patient's failure to respond to noisemakers and cymbals. The normal infant responds with head and eye movements and crying; the deaf infant makes little or no response to auditory stimuli. These tests also can be used with the small child up to about four or five years old.

In England, Sheridan[1] tests hearing in the very young by observing their reaction to and their recognition of simple objects such as a cup, a spoon and, in the case of infants, a rattle. With older children, she enlarges the tests to include such items as a handball, paper,

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dolls, cars, trains and ships. It is essential to have trained and patient personnel conduct all tests for recognition of sounds related to these objects.

Several other technics[2] also have been devised for testing the hearing reactions of the child less than five years of age. In cases in which the child's attention has a tendency to wander, a puppet-show technic has been used. The psychogalvanic skin-reaction method and the Galton whistle and piano-keyboard technic also should be mentioned in relation to measuring hearing in infants and smaller children. All these tests are helpful when used by trained personnel; however, the tests lack significance when used by the casual observer.

It is possible to make satisfactory audiometric studies of children who are about five years of age. This method of testing hearing is preferable to others, and most otologists are now using the audiometer rather than separate tuning fork tests as a reliable testing medium. However, I believe that results obtained from tests made with an audiometer are not exact measurements of hearing, since they depend a great deal on the examiner's ability to explain the required responses to the patient being tested. Several tests usually must be performed on children before the audiologist can be certain that the child understands the responses that are expected. I think that an error of at least 10 per cent should be allowed in interpreting audiograms. I also believe that in most instances, with only occasional exceptions, hearing above the 30 db level in all frequencies tested can be regarded as within the limits of normal. Those patients whose hearing levels skirt the 30 db line through all frequencies hear at the lowest level of normal hearing. When the hearing responses fall below the 30 db level in any frequency, the hearing level is considered subnormal.

Tests with the audiometer usually are quite reliable and very valuable for children between six years old and the early teens. All our work at the University of Nebraska College of Medicine has been limited to this group because of our close relationship with the hearing conservation program of the Omaha Douglas County school system.

Clinical Observations

In Nebraska,[3] as in many states, the school laws require that every child in the school system be examined for defective hearing. The state department of health and its district offices are enjoined to provide the schools with the instruments and personnel to carry out this program.

The pure tone audiometer was used by trained school nurses to screen about 11,000 school children in the three year period during which tests were supervised by the University of Nebraska. Of the children tested, 648 (5.9 per cent) were found to have hearing defects. Of this group, 531 (82 per cent) had conduction hearing losses. The loss of hearing in these pupils was caused by an interference with the conduction of sound impulses through the external canal, the eardrum membranes, the middle ear space, and movements of the ossicles. Special efforts were made to remove any cases of external canal obstruction from this group. After this was done, it could be stated that all children who had conduction deafness had complications of upper respiratory tract infection.

Eighty-four children (13 per cent) of the group with hearing loss had a perception or nerve-type deafness. This was caused by an interference with the transmission of the hearing impulse via the auditory nerve complex (the organ of Corti, the cochlear nerve, and the acoustic portion of the eighth cranial nerve from the end organ to its connection in the brain).

Thirty-two children (5 per cent) had a mixed-type hearing loss. In these cases, both conduction and perception components were involved.

The findings in this group of children were very similar to the results of other surveys which have shown that from 2 to 13 per cent of the children in this country have hearing defects.[4]

Conduction deafness—The most common cause of conduction deafness in the patients studied was the interference with the proper aeration of the middle ear by chronically infected and mechanically obstructive tonsils

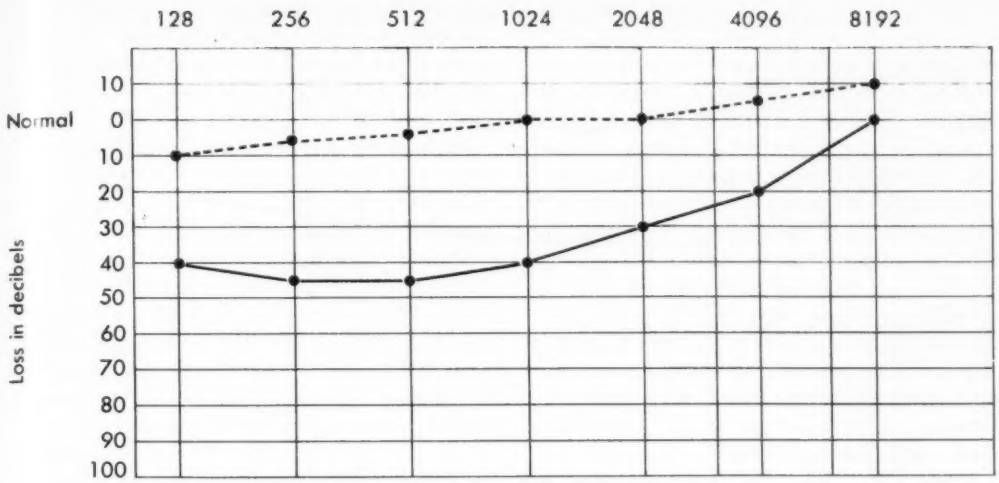

FIGURE 1. Audiogram showing initial hearing loss caused by infected tonsils and adenoids (dark line) and improvement following tonsillectomy and adenoidectomy (dotted line).

and adenoids. In the typical case of this type, there was a marked loss of hearing in the lower frequencies from 256 d.v. to about 2000 d.v. Most patients could hear the high frequencies better. A few children had good hearing in the lower frequencies and a hearing loss in the higher frequencies, but this finding was atypical.

In almost every case of conduction deafness, removal of the tonsils and adenoids resulted in a marked improvement in hearing. A graphic record of the improvement effected by this procedure is shown in figure 1.

The adenoids were most frequently the cause of disease of the eustachian tube in children who had had no throat surgery. This tissue often constituted a direct obstruction to proper aeration of the middle ear through the eustachian tube. The adenoids also caused most cases of nasopharyngeal obstruction in children who had had throat surgery. In many instances, the adenoids had not been adequately removed. Repeated infection of the nose and throat in many children in whom adenoidectomy had been adequate tended to restore much lymphatic tissue to the nasopharynx, particularly around the eustachian tube. In cases of adenoid and lymphatic hypertrophy in the nasopharynx for which surgery had been performed several times with no therapeutic effect, radiotherapy of the nasopharynx was frequently used to good advantage. Radiotherapy of the nasopharyngeal area, however, is used very sparingly and only by qualified radiotherapists.

Thirty-two cases (5 per cent) of conduction deafness in this series were due to serous otitis media, which can be caused by inflammation or an allergy. When this condition is not recognized, successive changes can lead to irreversible changes in the middle ear. Fortunately, these changes occur over a long period, and the evacuation of the middle ear by myringotomy or aspiration (or a version of this age-old procedure) is most helpful in restoring good hearing.

Serous otitis media is not easy to diagnose because the tympanic membranes frequently do not show the classic changes, such as a fluid level, bubbles in the middle ear, or changes in the color of the tympanic membranes. The condition always should be suspected, however, when the history of the hearing loss is rather abrupt and follows a mild upper respiratory infection or nasopharyngeal allergy with little or no otitic involvement in the acute stage. Figure 2 shows the initial hearing loss caused by this condition and the

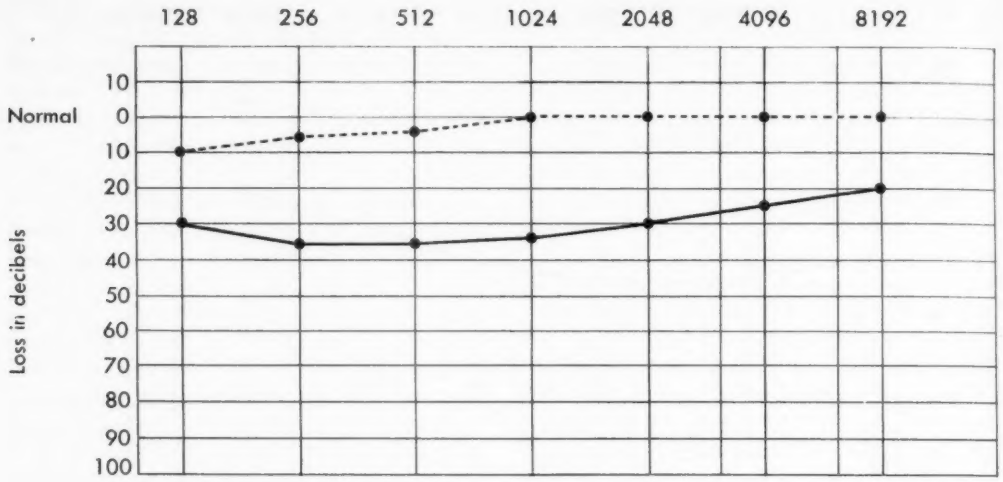

FIGURE 2. Audiogram showing hearing loss due to serous otitis media (dark line) and improvement after evacuation of the middle ear (dotted line).

improvement effected by evacuation of the middle ear.

In our clinic, the early use of antibiotics has prevented most complications formerly caused by acute otitis media. In this series, no cases of acute otitis media were seen; however, the complications of the disease, such as chronic otitis media with perforations of the tympanic membrane, growth of granulation tissue, and purulence of serous discharge from the middle ear, were noted in five patients (about 1 per cent) referred to the diagnostic clinic. The hearing losses in these patients varied from about 5 to 10 db to a loss of 60 to 70 db through all frequencies in one case.

In former years, after medical efforts to create a dry ear were exhausted, the operation performed in these cases was always an attempt to clear up infection rather than to restore hearing. The more recent work of Wullstein,[5] Zollner[6] and House[7] has been directed not only toward clearing the chronic infections present in ears affected with otitis media but also toward restoring the normal anatomic relations in the membrane and the middle ear. These otologists have concentrated their efforts on the surgical reconstruction of middle ear mechanisms that have been destroyed by acute suppurative disease. The surgical removal of chronic infectious tissue in the middle ear and its replacement with new, healthy tissue through application of advanced methods in plastic surgery have been a dramatic climax to the efforts of otologists to restore hearing in patients with chronic otitis media.

Otosclerosis—We noted only one case of deafness due to otosclerosis in the group of children tested. This condition seems to be more readily diagnosed in early adulthood, when it progressively restricts the movements of the stapes in the oval window.

It is important to describe the advances made in the treatment of otosclerosis, because the surgery which is used to restore hearing in the presence of this condition is basic in the treatment of pathologic conditions of the middle ear. Lempert's work in the development of the transtympanic approach to the middle ear resulted in the brilliant revival of the stapes mobilization operation by Rosen. Other pioneers in this field, such as Shambaugh and House, have stimulated many students of otology to duplicate this work.

Perception deafness—Perception or nerve-type hearing loss was found in 84 children (13 per cent) in this investigation. Some damage to the components of the internal ear or the auditory nerve had caused loss of hearing in

these children. The most common causes of such loss were the childhood diseases, such as mumps, scarlet fever, measles and meningitis. Accidents and blows to the head also accounted for deafness in some of the children. One case could be traced to the blast of a whistle close to the ear.

Perception deafness in the very young can sometimes be traced to a history of German measles in the mother during the first trimester of pregnancy.[8] A prolonged delivery and resultant anoxia also may result in this type of hearing loss. Although perception deafness due to drugs or antibiotics such as streptomycin was not observed in this series, such cases have been reported commonly in other studies of deafness.

Little can be done to remedy perception hearing loss once the damage has been done. Prevention of such hearing loss is confined to the limitations of the primary condition which causes the irreversible deafness.

The otologist needs the services of professional help in retraining these patients. Audiologists have made much progress in devising retraining methods which employ the hearing aid to utilize islands of hearing still present in many patients. Schooling which can be instituted early is essential in developing visual faculties for speech training. There is no hope at present in reversing such hearing losses once they have occurred.

Mixed-type hearing loss—Elements of both conduction and perception deafness were found in 32 children (5 per cent). The audiograms of patients with this mixed-type deafness show hearing loss in both the low and high frequencies as well as in the bone conduction. Early treatment of the causes of the conduction hearing loss frequently will stop the progressive loss of hearing in the nerve components in such patients.

Summary

1. Auditory tests for children of preschool age are rudimentary but satisfactory when conducted by highly observant parents and professional personnel.

2. Auditory testing of approximately 11,000 school children by pure tone audiometry revealed that about six of every 100 pupils tested needed professional attention because of noticeable hearing problems.

3. Eighty-two per cent of the group with hearing losses had conduction or remediable conditions which could be treated. These pupils usually recovered normal hearing. Five per cent of the group had mixed-type deafness, and it was possible to rehabilitate many of these patients.

4. Thirteen per cent of the children with hearing losses had perception deafness. Such patients receive much help from hearing aids, lip reading, and specialized schooling. Prevention of this type of hearing loss still depends on future developments in medicine and otology.

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Regional Anesthesia for Surgery of the Extremities

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Reassessment of the status of regional anesthesia is necessary in view of the many recent advances in anesthesiology and surgery.

The advantages and disadvantages of regional anesthetic procedures compared with general anesthesia are summarized, as well as the requisites for best results with the regional technics.

Certain operations involving the extremities comprise some of the most important indications for use of regional anesthesia. The procedures most commonly employed for such operations are described.

JOHN J. BONICA

THE past decade has seen many significant advances in anesthesiology, both in concepts and in clinical practice. Unprecedented numbers of physicians have entered this specialty, and the almost incredible progress in surgery has emphasized the urgent need for commensurate improvement in anesthesiologic care. There has ensued a remarkable increase in the knowledge of alterations of physiologic functions together with a marked revision of numerous concepts of anesthetic management and a consequent development of many new agents, new technics, and entirely new anesthetic methods.

All these factors have profoundly affected the status of regional anesthesia and indicate an obvious need to reassess the method to place it in proper perspective. This is especially true of its use in surgical procedures involving the extremities.

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Advantages of Regional Anesthesia

In selected cases, regional anesthesia when properly administered and completely effective for the duration of the operation offers certain advantages to patient and physician not obtainable with general anesthesia. This is particularly so in operations involving the

extremities, as block anesthesia of these regions does not interfere with cardiovascular and respiratory homeostatic mechanisms. The outstanding advantage is that regional anesthesia taxes the physiologic economy of the patient less than does general anesthesia. It is particularly useful in urgent situations when little is known about the patient. If shock is caused by pain, as in a case of a crushed extremity, regional anesthesia effects rapid improvement by relieving the pain. Of course, if shock is due to loss of blood or plasma, adequate fluid replacement is necessary. Regional anesthesia also is of great value when it is necessary to operate on a patient whose stomach is full of undigested food. The pain, shock, nervousness and other factors which usually are present in cases requiring emergency operation decrease digestion markedly and delay the emptying time of the stomach. In spite of preoperative gastric intubation, many of these patients' stomachs contain undigested material hours after the injury, and there is real danger of vomiting and aspiration during induction with general anesthesia. Patients in shock tolerate regional anesthesia of the extremities better than they tolerate general anesthesia.

The advantage of regional anesthesia for outpatients and for persons who dread losing consciousness has been recognized for years. The method is also preferable when prone, lateral and other unusual positions are to be employed, as in certain operations on the lower extremities and spine. Whenever fluoroscopy or roentgenography is a necessary adjunct to the surgical procedure, regional anesthesia eliminates the danger of explosion, respiratory depression, or obstruction in the darkened room, and enables the patient to cooperate with the surgeon. The fact that regional anesthesia obviates the hazard of fire and explosion is an important consideration.

One of the most significant advantages of regional anesthesia to the patient is the minimal postanesthetic nausea and vomiting. In addition, the immediate postoperative period usually can be made pain-free by employing one of the longer-acting local anesthetic agents such as PONTOCAINE® or by using the continuous technic. All these factors permit earlier ambulation and oral feeding, and consequently reduce postoperative pulmonary, gastrointestinal and thrombo-embolic complications.

The benefits to the surgeon also are numerous. Motor power may or may not be abolished by varying the strength of the anesthetic solution. A higher-strength solution will cause muscular relaxation of a degree not obtained with general anesthetics unless large amounts of these agents or muscle relaxants are given. If muscular relaxation is not necessary, weaker solutions produce analgesia without interfering with motor function. This is important in tendon repair, in that the patient may aid the surgeon in identifying the structures. In the absence of an anesthesiologist, a surgeon experienced in regional technics may block the operative field and then perform the operation. Although this practice should be discouraged when it is unnecessary, it is of great advantage in rural areas where a specialist in anesthesiology is not always available. In addition, regional anesthesia makes possible many minor operations in office practice. It is economical to use, and the equipment necessary can be transported easily.

Nurses appreciate the use of regional anesthesia because the patients return to the wards awake, without nausea or vomiting, and are able to help themselves immediately.

Disadvantages of Regional Anesthesia

One of the most significant disadvantages and limitations of regional anesthesia is that its technics are more difficult to master than are those of general anesthesia. A certain amount of discomfort is inherent in the method. Regional anesthesia, like many other methods, is not applicable to all circumstances and patients. As with general anesthesia, complications, some of which may be serious, can and do occur.

Requisites for Optimal Results

To obtain optimal results with regional anesthesia, both the physician and the patient should have a comprehensive conception of the block procedure. This means the physician must have a thorough and exact understand-

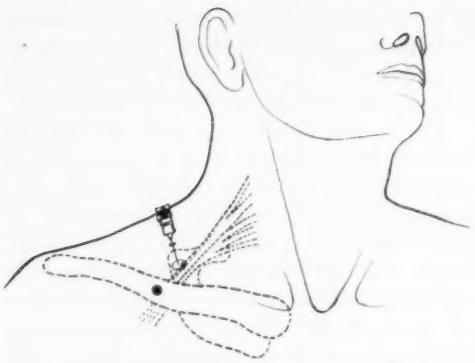

FIGURE 1. Brachial plexus block by the supraclavicular technic.

Reproduced courtesy of Charles C Thomas, Springfield, Illinois, from BONICA, J. J.: Clinical Application of Diagnostic and Therapeutic Nerve Blocks.

ing of the anatomy involved and the effects the interruption of nerve impulses will have on physiologic processes. Moreover, these facts must be approached from a point of view hitherto unknown to the medical student and unfamiliar to the physician who does not practice regional anesthesia. As with all technical procedures, the dexterity necessary to perform the blocks skillfully is gained by repeated performance. Equipped with the necessary knowledge obtained from textbooks and study of skeletons, manikins and models, the physician should perform the blocks on cadavers before attempting them on patients.

It is necessary to prepare the patient psychologically and pharmacologically. Among the preliminary measures necessary for success is the routine preoperative visit by the physician to discuss in detail the contemplated technic and its advantages. If the procedure is to be done for therapeutic reasons, whether surgical or nonsurgical, it is wise to sedate the patient, particularly if he is fearful.

Regional Anesthesia for the Upper Extremities

Some of the most important indications for regional anesthesia in orthopedic surgery, if not the most important, are certain operations on the upper extremity. The most common procedures for this purpose are (1) brachial plexus block, (2) block of the major nerves in the axilla or upper arm, (3) block of the major nerves at the elbow, (4) block of the major nerves at the wrist, and (5) local infiltration block and field block. Each procedure has important indications, advantages and limitations.

Brachial plexus block—Brachial plexus block may be used for any operation of the hand, forearm and lower part of the arm. Supplementing this technic with subcutaneous infiltration anesthesia on the medial and lateral aspects of the upper portion of the arm produces complete anesthesia of the entire extremity so that operations of the shoulder may be included. This procedure also is especially useful in controlling severe postoperative pain and as a diagnostic and therapeutic measure in such disorders as reflex dystrophy, postamputation pain, causalgia, and peripheral vascular disorders associated with orthopedic management. In experienced hands it is successful in over 90 per cent of the patients.

Technic—The technic for brachial plexus block which has given best results in my experience is a modification of the supraclavicular approach. One skin wheal is made 1 cm. above the midpoint of the clavicle just posterolateral to the subclavian artery. A 5 cm., 22 gauge, short needle is inserted and directed caudad, mesiad and dorsad. The needle is advanced slowly until paresthesia is obtained; aspiration is attempted, and 5 to 7 cc. of solution is injected. The needle then is advanced to the upper surface of the first rib and gradually withdrawn, with 1 cc. of solution being injected as the needle is withdrawn each centimeter. The needle is then redirected so that it will contact the upper surface of the rib 1 cm. from the sternal end, and the same procedure is followed. A third insertion is made and the needle is directed so it will strike the rib surface 1 cm. posterior to the first injection. With this three needle technic, usually 30 to 40 cc. of solution is used. I prefer 1 per cent XYLOCAINE® combined with 0.1 per cent Pontocaine with epinephrine 1:200,000. This usually produces analgesia for from three to five hours.

The disadvantage of the supraclavicular ap-

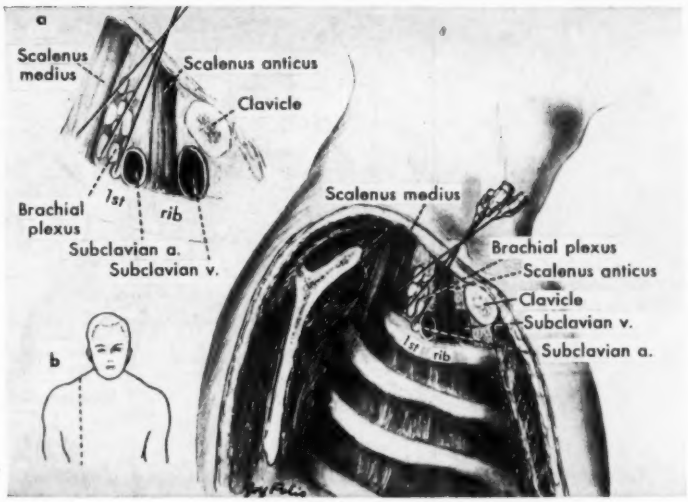

FIGURE 2. Sagittal section showing author's modification of supraclavicular brachial plexus block. The first injection is made through the middle needle, the second through the needle whose point is 1 cm. anterior to that of the first needle, and the third through the needle whose point is 1 cm. posterior to the first. a. Enlargement of the region in which the injections are made. Note the relation of the plexus to the first rib and clavicle, to the subclavian artery and vein, and to the scalene muscles. b. Site of sagittal section.

proach to the brachial plexus is that occasionally pneumothorax develops as a result of inadvertent puncture of the lung. This can be avoided with careful technic. Other complications, such as intravascular injection, which may cause generalized toxic reactions, can be avoided by careful aspiration each time after the needle is moved. Involvement of the phrenic nerve or the cervical sympathetic chain occurs if large amounts of solution are injected, but this usually is of no importance.

The advantages of brachial plexus block over other regional technics are: (1) The plexus is simpler to locate, (2) the onset of anesthesia is more prompt, (3) the duration of anesthesia is longer because the solution is injected into a relatively closed fascial compartment, (4) the entire extremity is anesthetized except the skin of the medial side of the arm and deltoid area, and (5) a tourniquet may be used.

Block of the major nerves in the axilla or upper arm—The problem of pneumothorax in the use of supraclavicular brachial plexus block has prompted many clinicians to substitute block of the major nerves in the lower part of the axilla or the upper region of the arm. The technic is carried out by having the patient abduct the arm to a 90 degree angle and palpating the lower portion of the axillary artery and the upper portion of the brachial artery, just behind the lower border of the pectoral muscles. In this region are found the termination of the cords of the brachial plexus and the beginning of the radial, ulnar and median nerves. The radial nerve is posterior, the ulnar nerve is medial, and the median

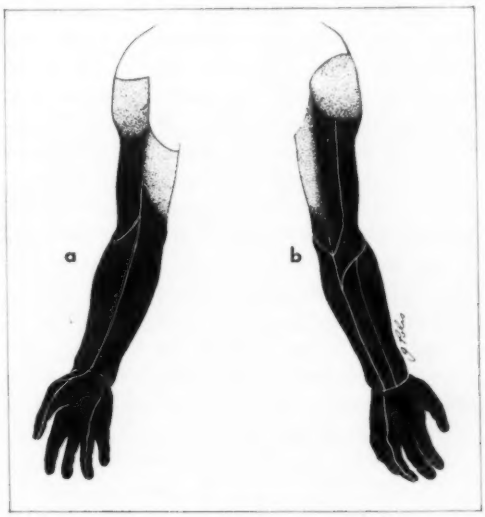

FIGURE 3. Anesthesia resulting from brachial plexus block. Stippling represents the area of hypalgesia due to overlap of other nerves.

Figures 2 and 3 reproduced courtesy of Lea & Febiger, Philadelphia, from BONICA, J. J.: Management of Pain.

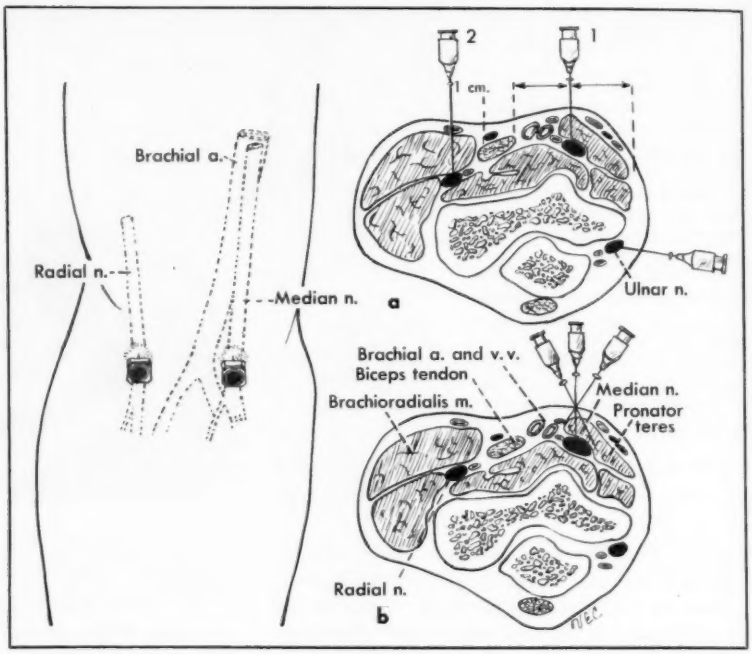

FIGURE 4. Technic of blocking the median, ulnar and radial nerves at the elbow.

nerve is anterolateral to the beginning of the brachial artery.

Each nerve is identified, and injections of 5 to 7 cc. of solution containing 1.5 per cent Xylocaine alone are made with a 25 or 22 gauge needle if the surgical procedure is to last less than one and a half hours. If the operation is to be longer, sufficient Pontocaine may be added to make a final concentration of 0.1 per cent. In the process of blocking the median nerve the needle is advanced anteriorly and laterally and the area is infiltrated to block off the musculocutaneous nerve. This is necessary to apply a tourniquet, because tourniquet pain is due to muscular ischemia and not to pressure of the skin, which causes anesthesia. A total of 25 to 30 cc. of solution is sufficient for complete block.

This block usually involves the axillary nerve also, but, of course, does not include the supraclavicular branches of the brachial plexus (anterior thoracic, dorsal scapular, suprascapular, subscapular, long thoracic and thoracodorsal nerves). If the axillary nerve is involved, then the entire extremity except the medial aspect of the arm in the deltoid region is anesthetized, including the bones, muscles and skin. Therefore, this procedure may be employed for all operations of the hand and forearm and lower part of the arm. If supplemented with subcutaneous infiltration anesthesia, it may be employed for operations of the upper part of the arm. It has an advantage over supraclavicular brachial plexus block in that the danger of pneumothorax is eliminated. Its disadvantages are that sometimes it is more difficult to locate the nerves and that the anesthesia is slower in onset and of shorter duration and requires greater concentration of local anesthesia.

Block of major nerves at the elbow—The median, ulnar and radial nerves may be blocked at the elbow or wrist by well-known technics. Block of the median and ulnar nerves at the elbow is relatively easy because the brachial artery is an excellent landmark for the median and ulnar nerves, which can be located easily in the groove between the olecranon of the ulna and the medial condyle of the humerus. The radial nerve is more difficult

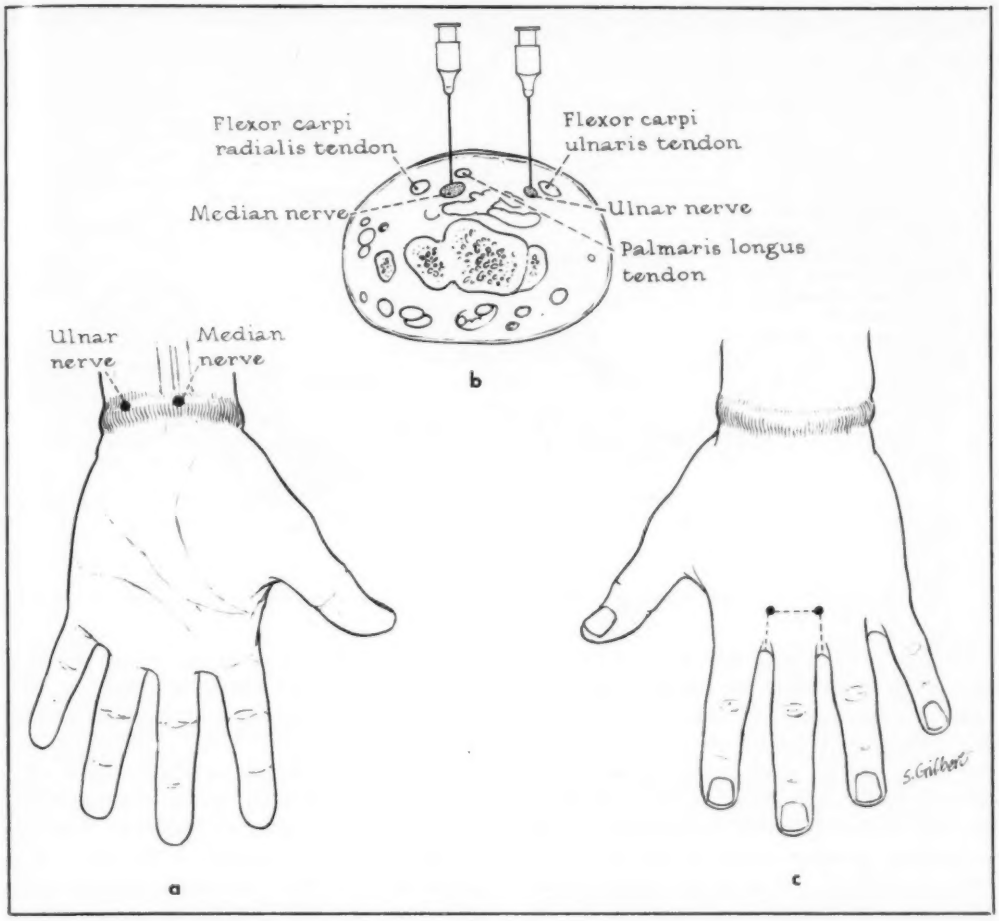

FIGURE 5. Technic of wrist block.
a. Sites of injection for ulnar and median nerves and the subcutaneous bracelet to anesthetize the cutaneous nerves.
b. Cross section depicting block of the median and ulnar nerves.
c. Technic of anesthetizing a finger by injecting the dorsal and volar digital nerves through two sites of puncture.

to contact because of the lack of deep landmarks in relation to it, but it can be blocked by fanwise infiltration. Supplementing this block with subcutaneous infiltration anesthetizes the extremity distal to the elbow. This procedure may be used for any operation of the hand and forearm.

Wrist block—Block of the ulnar and median nerves can be accomplished easily at the wrist. Because of the terminal branching of the radial nerve, it is necessary to employ subcutaneous infiltration anesthesia in the dorsal aspect of the wrist to anesthetize the structures supplied by this nerve. Injection of the median and ulnar nerves in the volar surface of the arm together with subcutaneous infiltration in the dorsal and volar surfaces will anesthetize the entire hand and therefore can be used for any operation in this region.

Blocks at the elbow and wrist offer the advantage of involving only a small portion of the extremity. However, they do not permit the use of a tourniquet, which frequently is necessary.

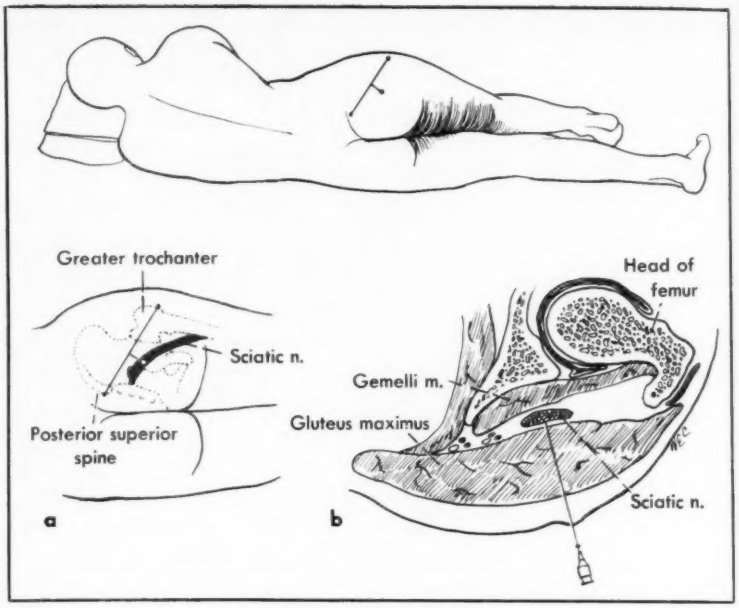

FIGURE 6. Technic of sciatic nerve block with the patient in the Sims position.
a. Relation of nerves to the bones and the method of locating the nerves.
b. Cross section at the level of the block.

Infiltration and field blocks—Infiltration technics may be used for minor surgical repairs of lacerations of the skin and subcutaneous tissue, for closed reduction of certain fractures, and for very minor operations of the fingers. Metacarpal or digital field blocks are very useful if carried out properly. These procedures produce minimal disability and carry a minimal risk of toxic reactions, and therefore are frequently employed in the physician's office for minor operations.

Regional Anesthesia for the Lower Extremities

The significant advantages of regional anesthesia for surgical procedures limited to the lower extremities are well known and appreciated by all physicians who have had sufficient experience with this method. Properly conducted, regional anesthesia produces minimal disturbance of bodily functions and offers all the advantages mentioned at the beginning of this discussion. The procedures which usually are employed are (1) subarachnoid block, (2) caudal block, (3) spinal epidural block, (4) block of the sciatic, femoral, lateral femoral cutaneous and obturator nerves at the level of the hip, (5) block of the common peroneal and tibial nerves at the knee, (6) block at the ankle, and (7) local infiltration or field block.

Subarachnoid block anesthesia—The simplicity and facility of spinal anesthesia are too well known to warrant discussion. The procedure is especially useful in the hands of a physician who has limited experience with other technics. It is particularly applicable in extensive reconstructive operations about the hip joints, in cases of fracture, and any other operations on bones, muscles, joints and soft tissue of the extremity distal to the hip.

Spinal anesthesia may be effected with minimal doses of Pontocaine (5 to 8 mg.), NUPERCAINE® (3 to 6 mg.), Xylocaine (50 to 60 mg.) or procaine (75 to 100 mg.) diluted to a volume of 2.5 cc. and injected in the third or fourth lumbar interspace. It is extremely important to avoid extension of the subarachnoid block above the tenth thoracic segment to obviate extensive vasomotor paralysis and consequent hypotension. However, the large vessels in the lower extremity receive sensory fibers and sympathetic nerves that enter the spinal cord at the T10 to L3 segments of the

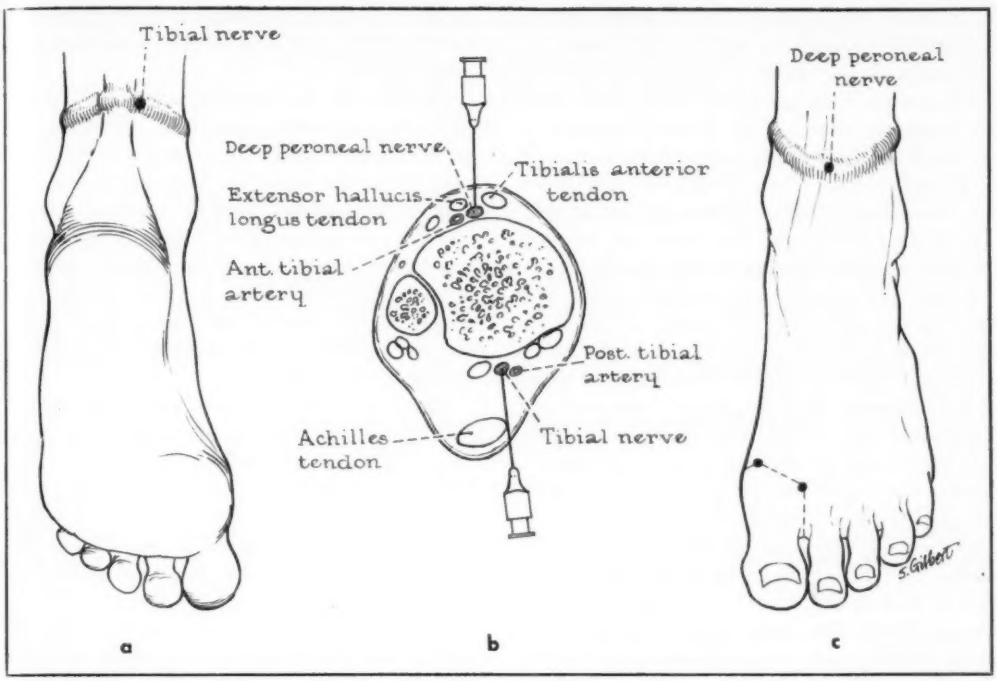

FIGURE 7. Technic of ankle and toe blocks.
a. Site of injecting the tibial nerve and the subcutaneous infiltration producing an anklet to anesthetize the cutaneous nerves.
b. Cross section depicting the directions of the needle to contact the tibial nerve posteriorly and the peroneal nerve anteriorly.
c. Site of injecting the deep peroneal nerve and the sites of injecting for anesthetizing the great toe.

spinal cord, and it is therefore necessary to carry the block as far as T10.

Caudal block—Single or continuous caudal anesthesia may be employed in a manner very similar to subarachnoid block for surgery of the lower extremities. Since the dura is not perforated, there is an obvious advantage over subarachnoid block; postanesthetic headache does not occur, and the potential hazard of the extremely rare postblock neurologic sequelae is eliminated.

I prefer the continuous technic and usually advance the tip of the plastic tubing about 15 cm. beyond the hub of the needle. This usually places it at the level of the first sacral vertebra, so that a much smaller volume of the local anesthetic agent need be used. Usually, 20 cc. of 1.5 per cent Xylocaine or a concentration of another drug equal in analgesic properties is adequate for analgesia. However, if complete muscular paralysis is required for orthopedic operation, it is necessary to employ 2 per cent Xylocaine or a comparable concentration of another agent.

Spinal epidural block—Anomalies of the lumbar spine are much less frequent than are anomalies of the lower sacrum, and therefore spinal epidural block affords a greater degree of success in the hands of a physician equally skilled in each technic. Moreover, a smaller volume of anesthetic solution is not necessary. Usually, 12 to 15 cc. of solution injected in the fourth or fifth lumbar interspace is sufficient to produce anesthesia of the lumbosacral segments. The concentrations of the solutions are similar to those mentioned for continuous caudal block.

Block of major nerves at the level of the hip

—Sciatic nerve block is a very useful regional anesthetic procedure which can easily be mastered. It may be used for closed reduction of fractures of the ankles and feet and to effect sympathetic block of the lower extremity to confirm the results obtained with lumbar paravertebral block. When combined with block of the femoral nerve, it provides anesthesia of the foot or leg and therefore can be used to advantage for operations and manipulations of these regions. Labat's method is the best technic to produce sciatic block. It entails injection of the nerve in the region of the greater sciatic foramen. Because the nerve is large, I usually make three injections (one over the nerve and one on each side of the nerve), injecting a total of 20 to 25 cc. of solution. I prefer a solution containing 1.5 per cent Xylocaine and 0.1 per cent Pontocaine.

When the operation involves the extremity below the knee, femoral block usually is combined with sciatic block. The technic is relatively simple. The nerve can be located easily 1 cm. lateral to the femoral artery just below the inguinal ligament. Since the nerve frequently branches above the inguinal ligament, paresthesia is more difficult to elicit than is the case with sciatic block. In such instances fanwise infiltration in the general area is effective.

The obturator nerve usually is blocked in the obturator foramen. The needle is inserted through a wheal raised 1 cm. lateral and inferior to the pubic tubercle and advanced until it contacts the superior ramus. The needle is advanced in a lateral, superior and posterior direction, keeping contact with the bone. After contact is lost, the needle is further advanced 2 cm. and 10 cc. of solution is injected. Paralysis of the adductor muscles indicates adequate block.

Injection of the sciatic, femoral and obturator nerves produces adequate anesthesia of all the deep structures of the lower extremities below the hip joint. A tourniquet may be applied without discomfort because all the muscles are anesthetized. Block of the lateral femoral cutaneous nerve completes analgesia of the extremities. This technic is relatively simple and is carried out just medial to the anterior superior iliac spine below the inguinal ligament.

Nerve blocks at the knee, ankle and foot—Block of the common peroneal and tibial nerves may be effected at the level of the knee. The tibial nerve is injected in the popliteal fossa, the common peroneal as it winds around the neck of the fibula. Supplementing these injections with subcutaneous infiltration will anesthetize the entire leg and foot.

Blocks of the saphenous nerve may also be carried out individually on the medial aspect of the medial condyle of the tibia. Because the saphenous is purely a sensory nerve, it may be blocked not only for surgical procedures but also for intractable pain.

Block of the deep peroneal and tibial nerves at the ankle supplemented by subcutaneous infiltration will produce anesthesia of the entire foot and may be employed for minor orthopedic operations in this region.

Metatarsal field block also may be used for operation involving the toes. Field block in various parts of the leg and foot may be similarly used, as mentioned in connection with anesthesia for the upper extremity.

The Value of Angiograms

IN DIAGNOSIS OF CONVULSIVE DISORDERS AND OTHER INTRACRANIAL LESIONS IN CHILDREN

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The results of cerebral angiography in cases of 138 children with convulsive disorders or suspected intracranial lesions are reviewed.

On the basis of the findings, the authors conclude that the test is safe and of value in diagnosing cases of the type studied.

WITHIN recent years cerebral angiography has been added to other diagnostic methods in the study of intracranial lesions, particularly in attempts to locate a focus of origin of convulsions, or to locate a suspected vascular lesion, tumor or scar. It may be used to replace pneumoencephalography or to supplement information obtained by that procedure.

Children with convulsions, even apparently focal convulsions, do not often have a demonstrable intracranial lesion that can be attacked surgically. Some tumors and vascular lesions of children can be dealt with successfully by surgery, however; and it is well worthwhile to locate and remove them. In addition it is of considerable value to know that no such lesion exists, that surgical treatment need not be considered, and that medication or dietary therapy should be undertaken on a long-term basis.

To determine the effectiveness of these methods we have reviewed the cases of 138 children (less than 17 years old) in which angiography was performed. Seventy-one children were studied because they had a convulsive disorder with a suspected focus. Sixty-seven children were thought to have focal organic lesions such as aneurysm, hemangioma or vascular anomaly, injury, subarachnoid hemorrhage, and so on, but did not necessarily have convulsions.

ALFRED UIHLEIN

HADDOW M. KEITH

Angiography was performed by members of the Section of Neurologic Surgery in all cases. The media used were iodopyracet (DIODRAST®) and diatrizoate sodium (HYPAQUE®), and in the majority of cases these were given percutaneously in amounts from 5 ml. to 72 ml. In occasional cases, particularly in young children, the cutdown procedure was used. Complications were few and minor. Among the

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TABLE 1

ANGIOGRAPHY IN CHILDREN INVESTIGATED BECAUSE OF CONVULSIVE DISORDERS (71 CASES)

CASES	AGES	FINDINGS	COMPLICATIONS
6	2½ years to 14 years	Positive information	1 (minor)
51	21 months to 15 years	Negative information	3 (minor)
5	2½ years to 13 years	Unsuccessful	1 (minor)
9	2 years to 14 years	Technically unsatisfactory	3 (minor)

138 patients, two had hematoma at the site of injection of the carotid artery, five had dye escape into the neck tissues, one had a brief episode of diplopia, one had temporary weakness of the right arm and leg, one had a minor degree of laryngospasm, two had nausea (one of them having had pneumoencephalography as well as angiography), one had urticaria, and one had headache for a few hours. None of the complications prolonged the child's stay in the hospital, or caused undue concern.

Investigation for Convulsive Disorders

Among the 71 children who were investigated because of convulsive disorders (table 1), definite organic lesions were found in six (8.5 per cent). In two of these cases the presence of a focal lesion had been suspected prior to angiography because intracerebral deposits of calcium had been noted in the roentgenograms of the skull, and in one of them a pneumoencephalogram had indicated a tumor. The angiograms confirmed the location of the lesions and indicated their types as tumor and hematoma. In one of the six cases, in which a mass lesion was suspected, the angiogram showed displacement of vessels by a presumed tumor and a right temporal astrocytoma was removed surgically. In two other cases the angiograms indicated nonsurgical focal lesions—in one, several anomalous arteries made visible by filling; in the other, a left-hemisphere abnormality interpreted as due to proliferative arachnoiditis. In the former the abnormality had been noted in the pneumoencephalogram. In the sixth case the angiogram indicated a mass and a pneumoencephalogram confirmed it; a porencephalic cyst was found.

In 51 of the 71 cases we obtained what we called "negative" information—that is, results which we thought ruled out a gross localized lesion. In one such case degenerative disease of the central nervous system was diagnosed by biopsy. In two other cases of this group surgical treatment was carried out, but the treatment was not based on angiographic findings: In one a glial scar was resected because of abnormality in the pneumoencephalogram, and in the other an electroencephalographic spike focus was removed from the right frontal region.

It seems, then, that among these 71 cases in which angiograms were made because of convulsive disorder, gross lesions were found

TABLE 2

ANGIOGRAPHY IN CHILDREN INVESTIGATED BECAUSE OF OTHER EVIDENCE (67 CASES)

CASES	AGES	FINDINGS	COMPLICATIONS
29	7½ months to 12 years	Positive information	6 (all minor)
29	2 years to 16 years	Negative information	4 (all minor)
7	10 months to 15 years	Technically unsatisfactory	None
2	13 years to 15 years	False positive	None

in six (8.5 per cent), and in one the angiogram gave evidence of a tumor not demonstrated by other means. On the other hand, the angiograms gave valuable negative information in 51 cases (72 per cent) by ruling out gross lesions. It is true that in two of these cases surgical treatment was given on the basis of findings made by other diagnostic methods, but the use of such methods is common in the diagnostic study of these cases, and their evidence frequently supplements that of the angiogram.

In 14 of the 71 cases the angiography was unsuccessful because of technical difficulties or the quality of the angiogram was not satisfactory enough to allow interpretation.

Investigation Based on Other Evidence

As mentioned earlier, 67 children were investigated by angiography because of suspicions of intracranial disease that was not necessarily associated with convulsions. In fact, in only three of the cases were convulsions associated before angiography. In a fourth, convulsive attacks occurred a year after the angiograms were made. As one might expect, the angiograms were more positively helpful in this group (table 2). Definite gross lesions were demonstrated in 29 cases (43 per cent). In 14 of these cases vascular abnormalities (for example, aneurysm and arteriovenous fistula) were suspected and shown to be present. In eight of the 14 cases tumors were shown definitely to be present. In a ninth case (increased intracranial pressure) pseudotumor was diagnosed, the absence of a tumor being confirmed by angiograms; and in another case marked by unilateral ptosis no tumor was found. We have called these positive findings, as tumor definitely was ruled out in both cases. In two additional cases cerebral atrophy was demonstrated—again a positive finding. In two more, some degree of hydrocephalus was demonstrated, and in the final case (regarded as possible post-traumatic edema) the angiogram led to a diagnosis of extradural hematoma.

There were 29 cases in which vascular anomalies, tumor, hemorrhage, cerebral atrophy, hemangioma, and other such abnormalities were suspected, but in which no gross lesion could be demonstrated by angiogram, and in which we considered the possibility of such lesions to have been excluded by this examination. Among these 29 cases were seven in which vascular anomalies were suspected and three in which orbital tumor was known but no intracranial extension was found; five cases of hemiparesis, one of suspected tuberous sclerosis, one of subarachnoid hemorrhage, one of third-nerve palsy, one of traumatic defect, and one of papilledema. In the remaining nine cases the preliminary diagnosis was "indeterminate."

Angiography was unsuccessful for technical reasons in seven cases; but in three of these, definite gross lesions were demonstrated by pneumoencephalography.

Finally, in two cases the angiograms indicated some type of gross lesion, but other methods of diagnosis showed them to be "false positive."

Summary and Conclusion

We have reviewed the effectiveness of angiography in the cases of 138 children.

Among 71 investigations of convulsive disorders, the presence of a gross intracerebral lesion was indicated or confirmed in six and excluded in 51. In the other 14, definite findings were not obtained.

Among 67 investigations made because of other evidence (although convulsions were included in a few cases), positive findings resulted in 29 and definitely negative findings in 29. False positive findings were obtained in two, and the angiography was invalid technically in seven.

Altogether, lesions were recognized in 25 per cent of cases and excluded in 58 per cent. The negative results gave a basis for confidence in planning treatment by means of medication or ketogenic diet. False positive results were less than 2 per cent, and failure to obtain definite findings occurred in 10 per cent. Complications, which occurred in 13 per cent, all were minor.

Cerebral angiography is a safe and valuable test in the diagnosis of convulsive disorders and intracranial lesions in children.

Renal Tuberculosis in Children

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Renal tuberculosis tends to invade and destroy both kidneys. It is difficult to detect in children, as the symptoms often are mild, the number of leukocytes in the urine may be very small, and the sedimentation rate of the erythrocytes usually is not increased. In a series of 23 cases, chemotherapy appeared to be more effective than was nephrectomy. Similar responses to chemotherapy have been obtained in both children and adults.

RENAL tuberculosis is a serious complication during childhood as well as in later life. It is serious because it tends to invade and destroy both kidneys. Figure 1 illustrates the progression of untreated renal tuberculosis in a period of 10 years. The child died of uremia before the advent of modern antituberculosis chemotherapy.

JOHN K. LATTIMER

Pathogenesis

According to the extensive and excellent work of Medlar,[1,2] renal tuberculosis is due to the hematogenous dissemination of tubercle bacilli to the glomerular or cortical arterioles from a primary focus in the lung or other part of the body.

Blood-borne tubercle bacilli frequently cause tiny tubercles in the glomeruli during hematogenous or "miliary" dissemination in children. If the tubercles do not heal quickly, they may spill tubercle bacilli down into the tubules, and the bacilli may appear in the urine. Medlar[1,2] strongly believes that tubercle bacilli never appear in the urine as a result of "filtration" through an intact nephron. The results of his studies confirm his contention that patients who have tubercle bacilli in their urine always have a sloughing renal lesion, however tiny it may be. He also believes that similar lesions probably are present in both kidneys because of the hematogenous nature of the dissemination. Minimal tubercles may occur in the kidney without miliary disease and without pyelographic changes (figure 2).

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They may follow primary pulmonary tuberculosis, and they were seen in 25 per cent of 5000 cases in which patients died of pulmonary tuberculosis at the Bellevue Hospital. It was noted, however, that not all of the tiny tubercles progress. Indeed, most of them heal spontaneously. Progressive cavitary lesions of the kidneys will develop in only 4 to 8 per cent of patients who have advanced pulmonary tuberculosis.[3]

Cavities in the kidneys are formed when the bacilli pass down the nephron from the tubercle in the glomerulus, stop in the narrowed portion of the loop of Henle, and cause a group of coalescing tubercles in the medulla. These coalescing tubercles may undergo caseation, and sloughing may occur into a calyx either on or beside the papilla of the involved pyramid. This will produce a small cavity in the medulla which can be demonstrated by pyelography. After a cavity has formed, it rarely heals spontaneously. It usually increases in size and destroys the entire lobule or pyramid by caseation. A cavity that opens into a calyx is closely analogous to a cavity that opens into a bronchus.

The disease then may follow two courses. First, the caseous contents of the pyramid may be retained. In this case, a large, white caseous mass will remain in the kidney and form a convexity of the renal outline. This mass may undergo calcification, and the pyramid may be replaced by a large mass of mortarlike material. Second, the caseous contents of the pyramid may be removed by sloughing, and a ragged cavity may be left. The margins of the cavity have a characteristic "moth-eaten" appearance which is easily recognized by the roentgenologist or urologist. The disease then may spread and involve the entire renal pelvis and the lining of other calyces with tuberculous granulations.

Blood-borne bacilli may cause foci in several pyramids at the same time. However, if the disease is fairly well localized in only one or two pyramids, the walls of the empty cavities may contract and cause indentations on the outer surface of the kidney. These indentations mark the site of the damaged pyramids and are helpful to the surgeon who may be seeking to excise the involved portion of the kidney. At the operating table, the surgeon may find the involved portions of the kidney by stripping the kidney capsule back and looking for telltale indentations or bulging caseous areas.

If the disease is allowed to follow its natural course, the bacilli spilling down the ureter

FIGURE 1. Progression of renal tuberculosis in a girl. Untreated renal tuberculosis (marked by circle around the tiny cavity in the lower calyx) spread through the girl's only kidney and caused death from uremia at the age of 19.

will infect the walls of the ureter and cause strictures and irregularities. Eventually, the bladder may be involved, and red areas may appear around the ureteral orifices and on the trigone. Patches of isolated ulcers may occur on the wall of the bladder. These ultimately lead to fibrosis and contraction of the bladder, and may cause urinary frequency and dysuria. This complication fortunately is rare in children. In males, the bacilli may involve the prostatic ducts and the prostate gland, and eventually may descend the ductus deferens and infect the epididymis.

Material

In the past 14 years, a diagnosis of genitourinary tuberculosis has been made in 23 cases on the Pediatric Urological Service of the Babies Hospital at the Columbia-Presbyterian Medical Center. Twelve of the patients were boys and 11 were girls. We still continue to see one or two new cases of this disease each year in spite of the availability of modern antituberculosis chemotherapy.

This study does not include any of our additional cases in which the presence of renal tuberculosis was discovered at necropsy. We have observed four other cases in which the presence of genitourinary tuberculosis was suspected but was not proved bacteriologically or histologically. In two of these cases, cultures of the urine produced chromogenic acid-fast bacilli that were not typical of tubercle bacilli. In each of the two remaining cases, microscopic examination of the urinary sediment revealed acid-fast bacilli only once.

Clinical and Laboratory Data

In 12 of the 23 cases, roentgenographic examination revealed destructive cavitary lesions in one or both kidneys, and cultures of the urine were positive for *Mycobacterium tuberculosis*. In the remaining 11 cases, cultures of the urine were positive for *M. tuberculosis*, but roentgenographic examination did not reveal any changes in the kidneys. The lesions were classified as minimal in these 11 cases. The incidence of cavitary and noncavitary lesions was approximately the same in the two sexes.

In six of the 11 cases in which the lesions were minimal, the urinary culture was positive for *M. tuberculosis* during frank miliary dissemination. The incidence of miliary tuberculosis was equal in the two sexes. The frank miliary dissemination caused death in one patient who was observed before the advent of modern antituberculosis chemotherapy. In

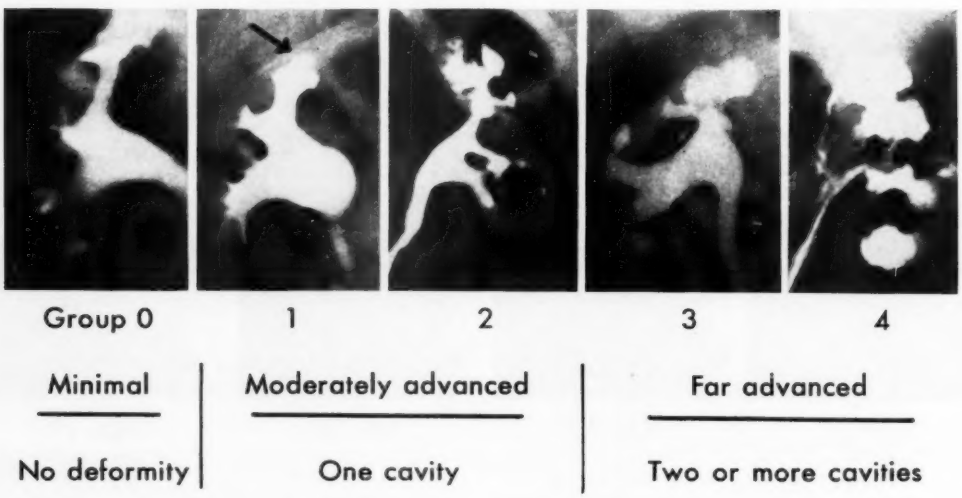

FIGURE 2. Roentgenographic classification of tuberculous lesions of the kidney.

10 of the 11 cases in which the lesions were minimal, positive urinary cultures for *M. tuberculosis* became negative after the prolonged use of antituberculosis chemotherapy.

The disease was classified as moderately advanced if roentgenographic examination disclosed only one cavity and as far advanced if this examination disclosed two or more cavities. The disease was moderately advanced in three cases. Nephrectomy was performed in one of these cases. In the two remaining cases, the disease was arrested by the use of triple drug therapy (streptomycin, sodium para-aminosalicylate and isoniazid) for one year.

The disease was far advanced in nine of the 23 cases. One kidney was removed in six of these nine cases. The patients in these six cases were observed before the advent of modern antituberculosis chemotherapy. In four of these six cases, the patients were cured; in the remaining two cases, the disease eventually involved the other kidney. In one of these two cases, the patient was a girl who died of uremia at the age of 19 years. Advanced lesions were present in both kidneys in three of the 23 cases. Two of these patients were treated successfully with chemotherapy.

In all of the five cases of moderately advanced or far-advanced renal tuberculosis in which triple drug therapy was used for one year, cultures of the urine became negative for *M. tuberculosis*. These patients have been followed for three years while the four patients who were cured by nephrectomy have been followed for 17 years.

In one case of uncomplicated renal tuberculosis and in one in which the disease involved the prostate gland, cultures of the urine became negative for *M. tuberculosis* without treatment. In one case in which the disease of the kidney was far advanced, the disease continued to progress despite use of therapy with two drugs (streptomycin and sodium para-aminosalicylate) for one year, but it was controlled by the subsequent use of triple drug therapy.

Genital tuberculosis was rare in the group of 23 cases. A hard mass was detected in the epididymis in two of the 12 male patients, both of whom were two years old. Epididymectomy was performed in one of these cases. In this case, the patient was observed before the advent of antituberculosis chemotherapy. In the other case, chemotherapy caused the mass to regress.

The bladder was involved in 10 of the 23 cases. The vesical involvement was severe in seven cases and mild in three cases. Far-advanced cavitary lesions of the kidney were present in the seven patients in whom the vesical involvement was severe, and, in all of them, the cystitis responded satisfactorily to chemotherapy. A contracted bladder was not observed in any case.

Tuberculosis of bone was present in six cases. The incidence of this complication was more common in males than in females. The hip was involved in four cases, and the foot in two cases. Although the vertebral column is the most common site of osseous tuberculosis in adults, it was not involved in any of the 23 cases. Bursitis was present in two cases. It was believed that the bursitis was tuberculous, but this could not be proved. In four of the eight cases in which tuberculosis of bone or bursitis was present, the renal lesions were moderately advanced or far advanced.

Tuberculous adenitis was present in two cases. This may have been the portal of entry of the renal infection although roentgenographic examination disclosed an old pulmonary lesion in 19 of the 23 cases. Signs of pulmonary or extrarenal tuberculosis were evident in all but two of the 23 cases.

In five of the 23 cases, the source of the tuberculous infection was unknown. In most of the remaining 18 cases, the patients had been exposed to persons with open pulmonary tuberculosis in their own homes.

Renal tuberculosis is not easily diagnosed. The symptoms often are mild, the number of the leukocytes in the urine may be very small, and the sedimentation rate of the erythrocytes usually is not increased even in cases in which advanced cavitary lesions are present.

In our group of 23 cases, the time that elapsed between the diagnosis of pulmonary tuberculosis and the diagnosis of destructive (cavitary) tuberculous lesions of the kidney

ranged from two months to four years. In adult patients this period ranges up to 20 years.

In six cases, cultures of the urine were positive for *M. tuberculosis* during miliary dissemination of the disease. Positive cultures of the urine were obtained in two patients who were being examined because of the presence of tuberculosis of bone. Doctors Alexander and Damrosch[4] noted in their series at Babies Hospital that in many children with miliary tuberculosis, cultures of the urine were not positive, and that renal tuberculosis did not develop subsequently.

As previously stated, evidence of previous pulmonary tuberculosis was present in 19 of the 23 cases. Old miliary lesions were evident in six of these and calcified primary lesions were present in 13. The calcified primary lesions often were rather extensive and included calcified lymph nodes in the hili. These calcified nodes were from 1 to 3 cm. in diameter.

Dysuria was the first urinary symptom in only eight of the 23 cases. Pyuria often was an incidental finding in patients who were being examined for other reasons. Among these eight patients, only two had mild, dull pain in the renal region, and only one had gross hematuria. In six of the eight cases, the patients did not have any symptoms except the dysuria, although microscopic examination of the urinary sediment disclosed three to five or more leukocytes in each microscopic field examined with the high-power objective.

The grade of pyuria was slight (one to three leukocytes in each field examined with the high-power objective) in 12 cases, moderate (5 to 10 leukocytes in each field) in five cases, and high in six cases. The leukocytes in the urine decreased sharply in number or disappeared after treatment in all but two cases. In these cases, the disease was advanced and involved both kidneys.

The time that elapsed between the diagnosis of primary tuberculosis of the lungs and the development of pyuria and destructive lesions of the kidney was two months to four years. On the other hand, moderate pyuria occurred simultaneously with the detection of miliary dissemination in several cases and the urinary cultures were positive for *M. tuberculosis*. In these cases, the infection of the glomeruli presumably was blood-borne, and, in most of them, the renal lesions healed spontaneously. In cases in which cultures of the urine were positive for *M. tuberculosis* and roentgenographic examination disclosed the presence of a cavity, the lesions obviously were older and were much more difficult to control than were the lesions in cases in which roentgenographic examination did not disclose any cavity.

The sedimentation rate of the erythrocytes was normal in seven cases. It was between 20 and 30 mm. in one hour in two cases; it was more than 30 mm. in one hour in seven cases, and was increased in all of the cases of miliary tuberculosis. It fluctuated in an unpredictable manner before treatment was started, but decreased toward normal after chemotherapy was started or after nephrectomy was performed. In cases in which the only active lesions were in the kidneys, the sedimentation rate usually was not increased. This suggests that in children, as in adults, renal tuberculosis usually does not cause an increase in the sedimentation rate of the erythrocytes.

Death occurred in only two of the 23 cases. Miliary tuberculosis was present in one of these. In the other, the patient died of uremia resulting from tuberculosis of the remaining kidney after nephrectomy had been performed. Both patients were observed before the advent of modern antituberculosis chemotherapy.

Chemotherapy

Chemotherapy was used alone in 15 of the 23 cases. Five of these patients had advanced cavitary lesions and 10 had minimal (noncavitary) lesions. In one of the five cases in which advanced cavitary lesions were present, the patient initially was treated with two drug chemotherapy (streptomycin and sodium para-aminosalicylate), but this treatment was not successful. The patient subsequently was treated successfully with triple drug chemotherapy (streptomycin, sodium para-aminosalicylate and isoniazid). The remaining four patients also received triple drug therapy and cultures

of the urine have remained negative for *M. tuberculosis* since the treatment was completed. The patients in this group of 15 cases were treated at least three years before this paper was written.

In all of the 10 cases of minimal (noncavitary) tuberculosis of the kidney in which chemotherapy was used, cultures of the urine became negative for *M. tuberculosis*. The therapeutic regimen was not the same in all of these cases. In some, the patients were treated soon after chemotherapy became available for miliary tuberculosis. At that time, we often started treatment by administering three drugs. The administration of one of these drugs was discontinued after treatment had been continued for some time, and one of the other two drugs was discontinued subsequently. The administration of the remaining drug was continued until the completion of the one year of treatment. In spite of this irregular early treatment, all of the patients responded satisfactorily. This corresponds with our experience in a large group of adult patients in which men with noncavitary renal tuberculosis responded satisfactorily to combined chemotherapy that was less intensive than that which is required for cavitary renal tuberculosis.

It is our practice to use triple drug chemotherapy for two years in any case in which a culture of the urine is positive for *M. tuberculosis*. At present, the patients are being treated in the following manner. A dose of 20 mg. of streptomycin per kilogram of body weight is administered intramuscularly twice a week. Five milligrams of isoniazid per kilogram of body weight is administered daily by the oral route in three divided doses, and 6 to 12 gm. of sodium para-aminosalicylate is administered daily by the oral route in three divided doses. In cases in which the lesions are advanced or are present in a solitary kidney, the patients often are treated for two or even three years if the response is not satisfactory. The triple drug regimen is used for one year in cases of genital tuberculosis.

When chemotherapy is used, the patients are permitted to get up for meals, to go to the bathroom and to spend time lounging on the bed. A minimum of standing is permitted.

At present, we are testing other chemotherapeutic agents which can be administered orally and which can be used in place of streptomycin. These agents may be used in place of other chemotherapeutic agents that cause an allergic reaction.

If extensive disease has destroyed the function of one kidney, and if secondary infection has developed and is causing fever and pain, it may be necessary to remove the involved kidney. In cases in which nephrectomy is contemplated, we administer isoniazid and sodium para-aminosalicylate for one to four months before operation, and continue this medication postoperatively for a total period of one year. These drugs are administered in an attempt to prevent dissemination of the infection during the operation and to control any infection that may be present in the other kidney.

Summary

Genitourinary tuberculosis is difficult to detect in children. Symptoms are often mild, sedimentation rate of the erythrocytes usually is not increased, and the number of leukocytes in the urine may be very small even in cases in which renal destruction is far advanced.

The disease was far advanced in nine cases, and nephrectomy was performed in six of these nine cases. This operative procedure failed to control the disease in two of the six cases. Triple drug therapy was used in five cases in which the disease was moderately advanced or far advanced. It controlled the disease in all of the five cases. The patients in these five cases have been followed for three years while the patients who underwent nephrectomy have been followed for 17 years. In 10 cases of noncavitary renal tuberculosis, cultures of the urine have remained negative for *M. tuberculosis* since the prolonged use of antituberculosis chemotherapy.

In the entire group of 23 cases, the time that elapsed between the diagnosis of pulmonary tuberculosis and the diagnosis of lesions of the kidneys ranged from two months to four years. Tuberculosis of bone was present in six cases.

Although our group of cases in which chemotherapy was used is small and the patients have been followed for a rather short time, the results are similar to those we obtained in a larger group of adult patients. In cases of renal tuberculosis of adults, modern triple drug therapy appears to be more effective than nephrectomy in preventing involvement of the other kidney. Owing to the success of chemotherapy, we are deferring nephrectomy. It remains to be seen whether chemotherapy will replace excisional therapy in cases of genitourinary tuberculosis.

We wish to acknowledge the assistance of the staffs of the Squier Urological Clinic, the Research Unit of the Kingsbridge Veterans Administration Hospital, and the Babies Hospital.

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Postgraduate Clinical NOTES

145. TUBERCULOSIS

The main impressions from attending these meetings and from talking "in the lobbies" are that there is still a vast amount of tuberculosis in the world, and that we still have much to learn about the disease. There is a wide gulf in the outlook between doctors from the more technically and socially advanced countries and those from the poor and economically underdeveloped ones. To the one group the more interesting questions may be rare infections with mycobacteria other than tubercle bacilli and important but relatively small differences between certain regimes of treatment: to the other group the important topics are more likely to be how tubercle bacilli themselves are to be detected and how any regime of treatment at all can be given to the millions requiring it. The first group may tend to look askance at any measures of detection and treatment that do not meet the scientific standards they would require in their own countries—though it was clear that these standards are not uniformly high. The second group may possibly feel that their own urgent problems of improvisation seem too little understood by the more fortunate.

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Ectopic Pregnancy

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Differential diagnosis is very important in ectopic pregnancy.

In more than 50 per cent of cases in the authors' series, pain was the predominant symptom, with a combination of pain and bleeding in second place.

Laboratory and clinical procedures for diagnosis of ectopic pregnancy are outlined, and data covering a series of 171 cases are presented.

In more than 95 per cent of all cases of ectopic pregnancy, the implantation of the ovum occurs in the fallopian tube. Other less frequent sites are the uterine cervix, the ovary and the abdomen. Unless ectopic pregnancy is diagnosed early, it can be, and often is, fatal. Although it occurs about once for every 200 cases in which infants are born alive, some authors estimate that it is the cause of 3 per cent of all the maternal deaths in obstetric practice. A recent study indicated that it was the cause of 2.2 per cent of all maternal deaths due to obstetric causes in Minnesota.

In a period of seven years, live infants were delivered in 29,590 cases at the Woman's Hospital in Detroit. Ectopic pregnancy occurred in 171 cases during the period, i.e., once for every 173 cases in which live infants were born. Anderson[1] reported that ectopic pregnancy occurred in one of every 120 obstetric cases in which the patients were Negro women and in one of every 177 cases in which the patients were white women. In our group of 171 cases, the incidence in the two races was about the same, that is, 83 (48.5 per cent) of the patients were white women and 88 (51.5 per cent) of the patients were Negro women.

In 14 (8.2 per cent) of the 171 cases, the patients were clinic patients; in 157 cases (91.8 per cent), they were private patients. The ages of the patients ranged from 16 to 45 years (table 1). In 60 (35.1 per cent) of the cases, the patients were in the third decade of life. An ectopic pregnancy had occurred previously in 14 (8.2 per cent) of the 171 cases.

Table 2 shows the parity of the patients. Seventy-nine (46.1 per cent) of the patients

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were nulliparous. This corresponds with the findings of other authors who have made a study of a comparable number of cases.

Etiology

Although mechanical obstruction of the fallopian tube generally is considered the most common cause of tubal pregnancy, we found definite evidence of previous salpingitis in only 30 per cent of the 171 cases. A history of previous pelvic inflammation was obtained in only 19 (17.2 per cent) of 110 cases reported by MacFarlane and Sperling.[2] However, a great difference of opinion exists regarding the etiologic role of pelvic infection in cases of ectopic pregnancy. Mahfouz[3] said that a history of salpingitis was obtained in more than half of 120 cases of tubal pregnancy, and Osiakina-Rojdestvenskaia[4] reported that mechanical obstruction of the fallopian tube was the cause of ectopic pregnancy in 76 of 100 cases.

Symptoms and Diagnosis

The initial symptoms were as follows: pain alone in 89 cases (52 per cent), bleeding alone in 40 cases (23.4 per cent), and both pain and bleeding in 42 cases (24.6 per cent). Other authors have reported that pain is the most frequent initial symptom. Pain was present in most of the cases although it was not always the initial symptom. Lavell[5] reported that pain was present in all of a group of 410 cases, and Marchetti, Kuder and Kuder[6] reported that pain was present in 98.5 per cent of 141 cases.

Both pain and bleeding occurred in 54 (31.6 per cent) of the 171 cases, although they were not necessarily the initial symptoms. The ectopic pregnancy did not rupture before operation was performed in any of the 171 cases. Eastman[7] said that almost all symptoms and signs of ectopic pregnancy are caused by rupture of the tubal wall and the resulting hemorrhage into the peritoneal cavity. In the seventh edition of "Shaw's Textbook of Gynecology,"[8] distinction is made between the dull aching pain due to distention of the tube in cases of unruptured ectopic pregnancy and the acute pain that is caused by rupture of the tube. In the literature, it also is recognized that bleeding and spotting can be caused by erosion of the fetus into the tubal wall.

There was a history of amenorrhea in all of the cases. Brady[9] attributed the absence of amenorrhea in many cases of tubal pregnancy to the possibility that improper implantation of the ovum does not result in the necessary endocrine action to prevent menstruation.

Syncope and urinary disturbances were infrequent symptoms, although Jarcho[10] reported that faintness and weakness occurred in 81 (47 per cent) of 173 cases, and Meagher[11] re-

TABLE 1

AGE OF PATIENTS

AGE *(Years)*	NUMBER	PER CENT
Under 20	6	3.5
21 to 25	33	19.3
26 to 30	60	35.1
31 to 35	44	25.7
36 to 40	23	13.5
41 to 45	5	2.9

TABLE 2

PARITY OF PATIENTS

PARA	NUMBER	PER CENT
0	79	46.1
I	40	23.4
II	25	14.6
III	21	12.3
IV	2	1.2
V	1	0.6
VI	1	0.6
VII	1	0.6
VIII	1	0.6

TABLE 3

CONCENTRATION OF HEMOGLOBIN

HEMOGLOBIN (*Grams per 100 cc. of blood*)	CASES	
	Number	*Per cent*
Less than 6	3	1.8
7 to 7.9	6	3.5
8 to 8.9	12	7.0
9 to 9.9	22	12.9
10 to 10.9	25	14.6
11 to 11.9	38	22.2
12 to 12.9	38	22.2
13 to 13.9	19	11.1
14 to 14.9	8	4.7

TABLE 4

LEUKOCYTE COUNT

LEUKOCYTES (*Per cubic millimeter*)	CASES	
	Number	*Per cent*
Less than 4000	1	0.006
4000 to 5900	13	7.600
6000 to 7900	32	18.700
8000 to 9900	30	17.500
10,000 to 11,900	25	14.600
12,000 to 13,900	24	14.000
14,000 to 15,900	16	9.400
16,000 to 17,900	12	7.000
18,000 to 19,900	7	4.100
20,000 to 21,900	2	1.200
More than 22,000	5	2.900
Unknown	4	2.300

ported that painful micturition occurred in 76 of 247 cases.

A pelvic mass was encountered in 42 (24.6 per cent) of our cases. Marchetti, Kuder and Kuder[6] reported that a pelvic mass was palpable in 99 (70.2 per cent) of 141 cases.

The concentration of hemoglobin ranged from less than 6 gm. to 14.9 gm. per 100 cc. of blood in our cases (table 3). The leukocyte count is shown in table 4. In a considerable number of cases, the differential leukocyte count revealed a marked shift to the left, which made the diagnosis doubtful, particularly if pain was localized on the right side.

A pregnancy test was performed in 50 cases. The result of the test was positive in 35 cases and negative in 15 cases. A positive test for pregnancy does not establish the presence of ectopic pregnancy, since the pregnancy may be intrauterine. On the other hand, a negative test for pregnancy does not rule out the possible presence of ectopic pregnancy.

In the differential diagnosis in these 171 cases, we first tried to determine whether the patient was pregnant. If we concluded or suspected that the patient was pregnant, we tried to determine whether the pregnancy was ectopic or intrauterine. The diagnosis of unruptured tubal pregnancy is one of the most difficult problems in gynecologic practice. This condition is most commonly mistaken for pelvic inflammatory disease, but it also may be mistaken for appendicitis, a twisted or ruptured ovarian cyst, red degeneration of a fibroid tumor, diverticulitis and pyelitis.

In addition to pain and bleeding, the symptoms of ectopic pregnancy include moderate fever, nausea, vomiting, frequent micturition and syncope. We encountered all of these symptoms in our group of cases, but we wish to emphasize that these symptoms are not always present. It is the frequent mildness or

TABLE 5

ADDITIONAL SURGICAL PROCEDURES

SURGICAL PROCEDURE	CASES
Dilatation and curettage	68
Puncture of cul-de-sac of Douglas	42
Appendectomy	40
Myomectomy	8
Excision of ovarian cyst	11
Cornual resection	5
Plastic operation on fallopian tube	1

TABLE 6

AMOUNT OF BLOOD ADMINISTERED BY TRANSFUSION

AMOUNT OF BLOOD (*Cubic centimeters*)	CASES	
	Number	*Per cent*
0	60	35.1
500	57	33.3
1000	27	15.8
1500	16	9.4
2000	2	1.2
2500	6	3.5
3000	1	0.6
3500	2	1.2

vagueness of these symptoms that must be carefully considered in the differential diagnosis. In order to make a correct diagnosis, we have found it necessary to make a careful evaluation of the type of pain and its site, the intestinal manifestations, the urinary symptoms, and the physical findings.

In any case in which doubt existed about the presence of tubal pregnancy, examination was performed with the aid of anesthesia. If indicated, posterior colpotomy was done while the anesthetized patient was being examined. Diagnostic curettage was performed in 68 cases. This procedure was performed in order to detect the possible presence of decidua. If gross or microscopic examination reveals decidua without any trace of chorionic villi, it is strong but not conclusive evidence of tubal pregnancy. Culdocentesis was performed in 42 cases. If the fluid obtained in this manner contained gross blood and did not clot on standing, it was considered indicative of ectopic pregnancy, and a laparotomy was performed.

Treatment

The primary surgical treatment was as follows: salpingectomy in 125 cases (73.1 per cent), salpingo-oophorectomy in 42 cases (24.6 per cent), and hysterectomy in 4 cases (2.3 per cent). Additional surgical procedures were employed as indicated (table 5). Blood transfusion was used in 111 (64.9 per cent) of the 171 cases. Table 6 shows the total amount of blood that was transfused in the various cases.

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CORRECTION

It has been called to our attention that a statement (page 138) in the article entitled "Rehabilitation of patients with hip fracture," by Drs. Itoh and Dacso, published in our August 1960 issue, was paraphrased incorrectly from the reference article, Horwitz and Lenobel.[2] The statement should have read: "At this time those experienced in the use of the prosthesis can promise the person with a fractured femoral neck that he or she will be walking again within two or three weeks."

Streptococcal Sore Throat and Throat Culture

NELL F. HOLLINGER*

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In view of the availability of laboratory aids applicable in modern medical practice, it is difficult indeed for the general practitioner to cite inconvenience, delay or inaccessibility as a reason for failure to employ these technics to determine whether or not a case of pharyngitis or tonsillitis is due to streptococci. As the general practitioner employs these aids, benefits will accrue in terms of more accurate diagnosis, applied specific therapy, and decreased opportunity for drug sensitivity and development of resistant strains of staphylococci, as well as possible clarification of the epidemiology of nonsuppurative sequelae of streptococcal sore throat.

NELL F. HOLLINGER

For immediate and successful therapy of streptococcal sore throat, satisfactory antibiotics are readily available. About 25 to 60 per cent of all clinical illness due to sore throat is of streptococcal etiology. This recent estimate applies not only in the United States but in Denmark, Canada, Scotland and England as well,[1] although among college students the figure may be as low as 11 per cent.[2] Clinical identification of those cases of pharyngitis or tonsillitis which are streptococcal in origin would permit adequate therapy on the basis of appropriate selection of drugs. Adequate therapy often removes the provoking factor in the appearance of sequelae. These tenets are well substantiated by clinical and research studies.[2,3] Through their application in general practice some 7,000,000 cases of streptococcal infection could be selectively treated each year in the United States.[4]

Clinical criteria for differential diagnosis of streptococcal and nonstreptococcal sore throat are not unique.[2,5] Redness of the fauces may be apparent in most cases (97 per cent) of sore throat due to group A streptococci, but this clinical sign also is present in over half

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of the cases of sore throat of nonstreptococcal origin.[1] Exudative pharyngitis, cervical adenitis or edema is present in at least half the cases of nonstreptococcal origin.[5] Nor is there any one combination of these signs that is pathognomonic of streptococcal sore throat.[2] Under optimal clinical conditions, the astute physician correctly diagnoses streptococcal sore throat in some 70 per cent of the cases.[6] But "more often than not" an etiologic diagnosis is wrong if based on clinical evidence alone.[2] It is precisely at this point that laboratory identification of group A streptococci would be an invaluable aid to the general practitioner and his patient if the laboratory report were made without delay. In an excellent review of endemic respiratory diseases three years ago, throat cultures for bacteria were judged the only basis for intelligent therapy of sore throat but were considered difficult to obtain.[2] With the recent development of less time-consuming methods, the past year has seen a tremendous increase in the use of throat culture. These newer laboratory aids are eliminating the dilemma of the conscientious practitioner in attempting to render adequate therapy immediately yet risking drug sensitivity and nonselective antibiotic therapy which is "ineffective and wasteful."[2]

Fluorescence Microscopy

The most rapid of the newer technics, fluorescence microscopy, can be made specific for group A streptococci. Such specificity is advantageous because one-tenth to one-third of the beta hemolytic streptococci isolated from the throat are of group C, G, B or F rather than of group A.

For over 50 years it has been known that most substances which absorb light show a measurable fluorescence. In fluorescing, such substances emit visible light of different wavelength from the irradiating light absorbed. If the irradiating light is ultraviolet or blue, approximately 290 to 340 or 450 to 475 millimicrons in wavelength, the absorption has a relatively greater efficiency of excitation of fluorescence.[7] One photon of light may be emitted for four absorbed. Modern methods and equipment have ensured the 150 photons per second which must be received by the eye if the fluorescence is to be visible.[8] A single bacterium is evident when combined with antiserum conjugated with a dye which can absorb ultraviolet light and emit this energy as visible fluorescence.

Streptococci irradiated with ultraviolet light can be detected in a microscope dark field by the emission of yellow-green light from fluorescein-tagged specific antiserum which has combined with streptococcal antigen. When all preparations are ready, less than half an hour is needed for streptococcal-antibody fixation on a slide, the washing free of surplus antiserum-dye conjugate, and the observation of the dried smear under ultraviolet light. If only absorbed group A antiserum is used, the physician can have the laboratory report while the patient remains in the office.

Direct smears from the patient with a sore throat are useful if positive for fluorescence by the absorbed, tagged-antibody technic. However, the patient may harbor streptococci which are not transferred to the microscope slide from the throat swab. Such streptococci would grow if the throat swab or inoculated transport fiber were placed in broth or on solid culture medium. After two or more hours a slide can be prepared with bacterial growth from the culture medium, and absorbed tagged antiserum then is added to the slide as for a direct smear.[9]

An indirect method of fluoroscopy involves the use of standard absorbed antiserum and a fluorescein-tagged antiglobulin for general use. After the streptococcal antigen has combined with specific antibodies in the standard absorbed antiserum, the excess antiserum is washed free and fluorescein-tagged rabbit antiglobulin is added to combine with these antibodies fixed by the streptococci.[7] This method, employing a tagged antiserum for general use, is less costly and, properly applied, appears to be quite specific. Stable fluorescein isocyanate is now available as the dye for tagging the antiserum.

Limitations—Grouping streptococci by means of fluorescence microscopy is, then, a serologic technic involving one or more antigen-antibody reactions in addition to prior

conjugation of the dye. The technic is subject to the usual limitations of serologic reactions with respect to sensitivity and specificity. Cross reactions do occur, group A streptococci reacting with group C antiserum unless the latter is absorbed with group A antigen. If the antiserums are prepared and conjugated at the laboratory the difficulties inherent in their preparation and conjugation will be encountered. Necessary absorption and dialysis decrease the yield. If the conjugated antiserum is purchased, it may deteriorate, resulting in false negative results unless carefully controlled. The technic requires a competent serologist with a superior background in immunology and a knowledge of fluorescence microscopy.

Because of the optical equipment, installation may be costly unless a laboratory-devised nonfluorescing instrument is assembled. One instrument company (Zeiss) now is making its entire line of microscopes of nonfluorescing materials so future installations will require only an ultraviolet light source and the microscope already in use. With its potential for rapid differentiation, fluorescence microscopy is rapidly taking its place as a laboratory aid in clinical diagnosis. Classification of streptococci by grouping now can be one of these aids because antiserums are available from a biological house (Difco) and fluorescein-tagged antiglobulin is available from several chemical houses. Practical use of fluorescent antibody technic as a laboratory aid in the identification of certain bacteria other than streptococci will be delayed until a specific antiserum is available for each bacterium to be identified.

Filter Paper Strip

A second new development in the isolation of beta hemolytic streptococci has been made in the method of transport. Pilot, field and reference studies have shown that group A streptococci can be isolated and identified after transport on certain dry fibers, to be described. Earlier methods of specimen transport were satisfactory for special laboratory use but scarcely convenient for the practicing physician. Many of these methods were dependent on transport of the specimen in culture media containing inhibitory agents or enrichment substrates which could not be stored in the office for prolonged periods without deterioration. For this reason these methods were abandoned by physicians wherever the transport media were not available in a satisfactory condition outside the larger laboratories specializing in streptococcal isolations. Many agar-base media were found to dry in storage or to separate into pieces during the shipment. Recovery of streptococci from such media was difficult or impossible. Laboratory results on identification of streptococci received on the unsatisfactory media discouraged the use of throat culture by the general practitioner.

The technic of transporting throat swabbings on certain dry fibers has increased the use of throat culture fourfold to tenfold.[10] The fiber currently proving most adaptable is cellulose in the form of filter paper.[11] The filter paper, cut into a strip about 2 by 5 cm., is fixed between glassine protectors, placed in an aluminum foil or plastic cover and sterilized as a kit; or the sterile manufactured kits may be used (Culpak-kit, Diagnostic Associates).

At the patient's side the filter paper kit is opened. Throat swabbing is done with the usual care, and then the swab is rolled and streaked heavily over the surface of the filter paper (figure 1). The kit is left open to air dry the thoroughly inoculated strip; three to five minutes usually is sufficient, but up to 10 minutes may be required. The foil then is refolded around the filter paper strip or the strip is placed in a plastic envelope and delivered to the laboratory. If the kit must be mailed, it is placed in an envelope and sent by first-class mail.[11]

In the laboratory, the filter paper strip is removed, placed on the classic blood agar-base culture medium, and incubated at 37° C. Forceps may be used in handling the strip (figure 2). The 37° C. incubation may be interrupted at the end of two to six hours and the strip removed to another culture plate, or to an unused area of the same plate, if a colony count is desired. The original or primary plate and the second or replica plate then are in-

FIGURE 1. Inoculating a filter paper strip from a throat swab.

FIGURE 2. Removing a filter paper strip from a culture plate.

cubated 18 hours. If beta hemolytic streptococci are present, one or more discrete colonies will be surrounded by a clear zone of hemolysis on the primary plate (figure 3). The secondary plate shows a broad zone of confluent lysis which may extend over the entire area of the filter paper. Of a series of 1,098 children, 234 had cultures positive for beta hemolytic streptococci by the filter paper strip technic. An isolate from each positive culture was grouped by the precipitin test by courtesy of Dr. Elaine Updyke at the Communicable Disease Center at Atlanta.[11]

Paired culture studies give results as shown in figure 4, indicating the high degree of efficiency of the filter paper strip technic. In these studies two swabs were passed carefully over and around the pharynx either in sequence or simultaneously. One swab immediately was streaked onto blood agar, which was incubated at once as a control culture by the classic method. The other swab was streaked and rolled onto a filter paper strip, which was in transit or held for 2 to 10 days and then cultured. Of 457 cultures positive for beta hemolytic streptococci either by the classic control method or by the filter paper strip transport technic, 432 or 95 per cent were positive by culture after transport by the filter paper strip technic (figure 4). This new filter paper strip technic disclosed as many positive results as, or more positive results than, did the matched controls for those cases in which the control count was few to 25, or zero, recovery being 122 per cent and 100 per cent, respectively. The lowest percentage of recovery was for cultures matched with controls having only a few colonies, and was 78 per cent. The difference in results in figure 4 is not more than would be anticipated on the basis of variability of throat flora. Army studies published 12 years ago and findings on a civilian population published last year show a variability of more than 25 per cent on two throat cultures made in sequence on the same person by the same technic.[12,13]

Dacron®-tipped Swabs

Another fiber on which beta hemolytic streptococci can be transported satisfactorily is Dacron.[11] Paired culture studies, matching classic controls and cultures streaked from Dacron-tipped throat swabs transported in a tube with desiccant, yield results essentially the same as those presented for streptococcal recovery by the filter paper strip technic and matched controls. For hospital use, where the swab is streaked on the culture plate within an hour or two after the throat swabbing is made, Dacron has given better results than has cotton on swabs held in broth for this same time interval. The added advantage of a colony

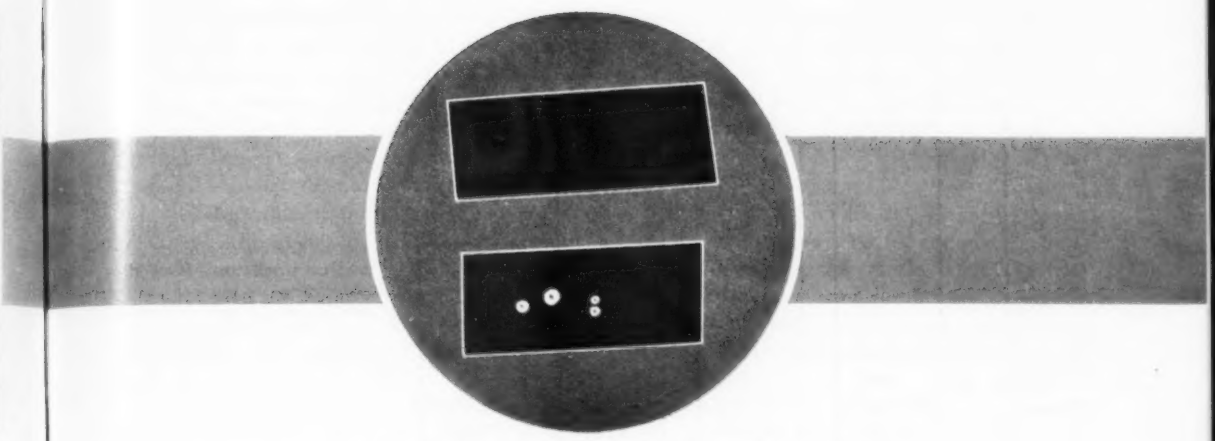

FIGURE 3. Complete lysis around colonies of beta hemolytic streptococci. Filter paper strip in place.

count from the original swabbing accrues from the use of Dacron, there being no increase in the number of streptococci as occurs in a holding broth.

Agar-base Transport Media

In Canada an agar-base medium is becoming popular for clinical use.[14] The throat swab is inserted into this medium for transport. Many types of bacteria survive such treatment. The disadvantages are some inconvenience in storage and the chance of breakage in transport, as was true of media that were developed much earlier.

Augmented Medium

To a classic beef-heart-infusion agar base, maltose, nucleic acid and neomycin have been added. On this augmented medium containing nucleic acid and maltose, the diameter of the beta hemolytic zone of streptococci is markedly increased and the edges of the zone become sharply defined. The antibiotic decreases the growth of other bacteria, including alpha streptococci. Physicians cooperating to test the method for office use were able to recognize the beta hemolysis and continued to use the medium after the study terminated. In the series reported, 30 of 96 beta hemolytic streptococcal strains isolated were group C or G, the remainder being group A.[15] It is possible that the antibiotic may inhibit some strains of beta hemolytic streptococci.

Epidemiologic Considerations

Under certain housing conditions, especially in the armed services, it has been established that the spread of streptococcal pharyngitis and streptococcal tonsillitis is dependent on proximity. In these population groups the incidence of nonsuppurative sequelae following streptococcal sore throat may be 3 to 5 per cent.[4] In an effort to reduce both the spread of streptococcal sore throat and the incidence of sequelae, the Casper project originated.[16] In this Wyoming community, firm control measures ensure mandatory school absence as the alternative to culture and therapy for children known to have sore throat. Establishing such mandatory alternatives in all communities does not appear to be warranted on the basis of preliminary data from Philadelphia, where there is a high incidence of streptococcal infection and a low incidence of sequelae.[5] These Philadelphia findings conform with those in Florida.[17]

If culture and effective therapy are to be employed, streptococcal grouping may be necessary. From throat cultures an appreciable percentage (15 to 30 per cent) of the streptococcal isolates may be classified as group C, G, B, F or K. These organisms are not sensi-

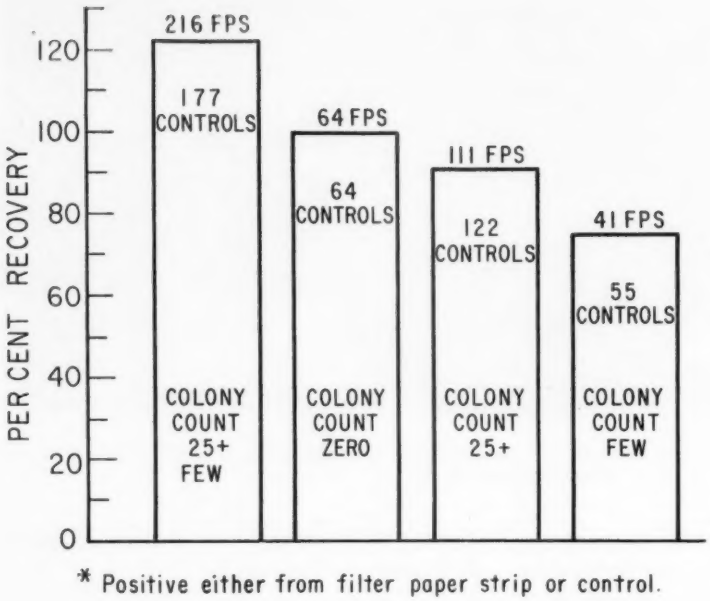

FIGURE 4. Recovery of beta hemolytic streptococci from filter paper strips by number and per cent positive* and by colony count.

tive to penicillin therapy as are group A streptococci, nor are they usually considered as pathogens. Prolonged antibiotic therapy, such as is incident on an attempt to eradicate beta hemolytic streptococci not of group A from the throat, may leave the patient a carrier of an antibiotic-resistant staphylococcal strain.[18]

Streptococcal typing is time-consuming at present, since a pure bacterial culture is required. Typing antiserums are difficult to prepare and are not available as a biologic supply. For these reasons, streptococcal type is not routinely determined. The epidemiology of the nonsuppurative sequelae of streptococcal sore throat might be clarified if typing were made available on pure cultures from civilian groups. For example, the association between type 12 streptococci and acute diffuse glomerulonephritis is considered significant with respect to data on naval recruits.[19] Long-term observations on the validity of this association, as made by general practitioners on their patients, would afford valuable information on the natural history of this disease in nonmilitary groups if streptococcal typing were made available.

Virulence or pathogenicity of beta hemolytic streptococci is yet to be determined by simple laboratory procedures. The elaborate methods currently reported as reliable are exacting and difficult,[20] although a less complicated method of detecting M protein is now available.[21] The colony count on culture media has been suggested as an index of streptococcal pathogenicity, but high colony counts often are found for well persons. Even with the newer technics, the laboratory report is no substitute for the considered judgment of the practicing physician. But the practicing physician having culture reports available comes to view them as an indispensable aid.[6]

Comment

Adoption of one or more of the five technics reviewed depends on need and convenience with respect to throat culture. Wherever fluorescence microscopy already is in use, as for screening for evidence of cervical or vaginal cancer, the fluorescent antibody technic for the classification of streptococci by groups can be added at minimal cost. This is the method of choice for rapid grouping of streptococci in throat cultures, provided an experienced serologist devotes time to the technic.

Dacron-tipped swabs afford all the advantages of any transport technic if the patient and the laboratory are within the same office building or hospital. If the patient is some distance from the laboratory, the transport medium of choice is the filter paper strip, since it can be stored indefinitely, is ready for use, and, after inoculation, permits the recovery by culture of any group A streptococci present after hours or days in transit. As an all-purpose transport medium suitable for subsequent recovery of many types of bacteria, including streptococci, the medium of Stuart* has no superior if the supply is fresh.

Physicians desiring to incubate and read throat cultures in their own offices will find augmented medium convenient for the growth of beta hemolytic streptococci. The hemolytic zone is broad and sharply defined on this medium. There is some possibility of inhibition of pathogenic streptococci. Difficulty in obtaining satisfactory nucleic acid has been experienced by workers preparing the medium, but prepared plastic plates are available in Palo Alto, California.

Technics now in use in public health laboratories in three states illustrate the combination of need and convenience applied in method selection. California, fostering its local laboratory program, does not offer to the private physician a state laboratory service of streptococcal culture. City and county laboratories within California offer such a service according to demand and custom. Four large counties and a city laboratory found demand for throat cultures increased many times when the filter paper strip technic was used. Colorado, with few branch laboratories and a large geographical area to serve, currently is introducing the filter paper strip technic as a means of transport. Streptococcal grouping by the fluorescent antibody technic has been successfully employed for over a year by the Colorado state laboratory. In contrast, the small geographical area of Connecticut permits distribution and return of tubes of 1 per cent agar-agar with relative ease. After the specimen is taken, the swab is plunged into the agar gel in the bottom of the tube and returned to the laboratory in that manner. This method of collection has been employed successfully for 25 years.

*PRE-MED® Holding (Transport) Medium (Hyland Laboratories) is based on Stuart's formula.

Conclusion

In view of the availability of current methods, it is difficult indeed for the general practitioner to cite inconvenience, delay or inaccessibility as a reason for failure to employ laboratory findings as an aid in ascertaining whether or not sore throat is of bacterial origin and, specifically, whether or not a case of pharyngitis or tonsillitis is of streptococcal origin. The speed of fluorescence microscopy, the ease of transport of throat swabbings on dry fibers of filter paper or desiccated Dacron swabs, and the use of new media in the physician's office have brought laboratory methodology into line with the many requirements of modern medical practice. As general practitioners employ these laboratory aids, benefits will accrue in terms of more accurate diagnosis, applied specific therapy, and decreased opportunity for drug sensitivity and for resistant strains of staphylococci to become manifest. In addition, evidence may be accumulated in clarification of the epidemiology of nonsuppurative sequelae of streptococcal sore throat in nonmilitary populations.

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Postgraduate Clinical NOTES

146. PEDIATRIC CARE

About 85 per cent of the children in this country receive their pediatric care from the general practitioner. It is the general practitioner, therefore, with training and orientation in the over-all picture of the mentally retarded child, who offers the greatest hope for these unfortunate families. However, training and orientation must be started in his professional infancy, during his student days. Though mental retardation is not a popular subject today, the student must be impressed with the importance of the condition as a challenging medical problem with many social and economic implications which exert their impacts not only on the family itself, but frequently on the community as a whole. He must be impressed with the urgency of early diagnosis, the methodology involved in the evaluation of the individual patient, and the finesse of interpreting the information to the parents. It can be done without the blessings of curriculum committees. It should be done at the time the student is in the process of formulating his philosophy of medicine. It is sure to reflect itself later, in the quality of service to the families under his care.

C. E. Goshen, Psychiatric training and its relation to medical education. *Journal of Medical Education*, April 1960, pp. 360-369

Ventricular Tachycardia

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Ventricular tachycardia most often is a manifestation of intrinsic heart disease or digitalis intoxication. Differential diagnosis is of utmost importance in planning treatment.

Intravenous administration of procaine amide hydrochloride is the treatment of choice. However, if the arrhythmia occurs without underlying heart disease and is well tolerated, orally administered therapy is preferable to that given intravenously.

Digitalis is no longer contraindicated in ventricular tachycardia unless intoxication with this drug is suspected.

NaEDTA has proved effective in digitalis-induced ventricular tachycardia.

GLENN D. LUBASH

VENTRICULAR tachycardia is a relatively rare but important cardiac arrhythmia. Although cases are reported with recurrence over several years,[1] it most frequently occurs in the presence of severe organic heart disease and is often accompanied by shock and congestive heart failure. Since death may be imminent, the recognition and management of ventricular tachycardia constitute a true medical emergency.

Etiology

Ventricular tachycardia occurs most often as a manifestation of intrinsic heart disease or digitalis intoxication. Since the management of the arrhythmia differs somewhat when it is secondary to digitalis administration and since digitalis is a standard drug in the treatment of heart failure, the differential diagnosis is of great practical importance. The value of a good history cannot be overestimated. Particular attention should be paid to the details of prior digitalis administration and to the possibility of electrolyte imbalance. For example,

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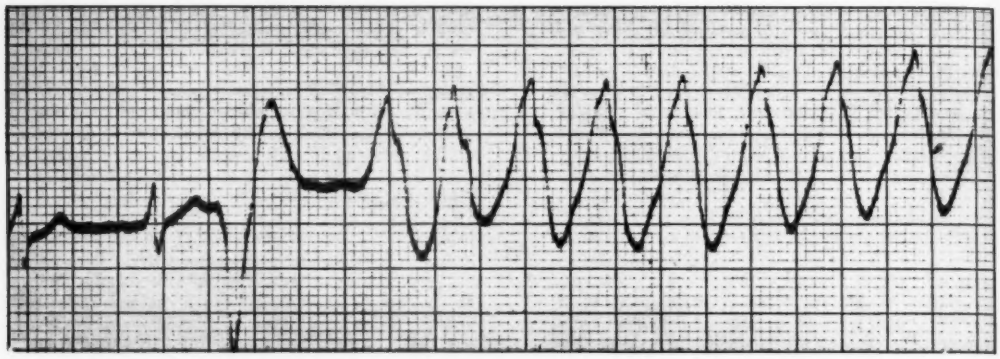

FIGURE 1. Electrocardiogram of a 39 year old man with rheumatic heart disease. Following an induced diuresis of 2.5 kg., the patient had paroxysms of palpitation. Plasma potassium was normal.

Atrial fibrillation, seen at the left, was present previously. Following a ventricular premature contraction (third beat), a run of ventricular tachycardia from a different ectopic focus was recorded. Note the slur on the downstroke of the QRS complex. Since the basic mechanism was atrial fibrillation and since this slur could not be timed independently of the QRS complexes, it cannot represent atrial activity.

Ventricular tachycardia disappeared after an infusion of potassium chloride.

digitalis intoxication may be caused by hypopotassemia induced by vomiting and diarrhea from an ordinary gastroenteritis. Diuretic drugs and adrenal steroids may also cause digitalis intoxication by a similar mechanism. In such instances, hypopotassemia is secondary to urinary potassium loss.[2]

Bidirectional or multifocal ventricular tachycardia is most often due to digitalis intoxication.[3] Ventricular tachycardia also has been observed in association with dissecting aneurysm,[3] chloroform or cyclopropane anesthesia,[4] shock, and sodium lactate therapy.[5]

Diagnosis

It is possible to suspect the presence of ventricular tachycardia at the bedside.[1,6] It is a regular tachycardia with rates from 150 to 250 per minute. Most often, the rate is between 150 and 180 per minute. At times, slight irregularities in rhythm may be noted. A more important auscultatory sign is the changing intensity of the first heart sound due to the varying position of the atrioventricular (AV) valves at the moment of ventricular systole and related to the AV dissociation usually present. Multiple low-frequency sounds heard in a single cardiac cycle also may provide a clue to the presence of ventricular tachycardia. These are said to be due to wide splitting of the first and second heart sounds plus gallop sounds.[6,7] Carotid sinus stimulation has no effect on this arrhythmia.

Electrocardiographic confirmation of the diagnosis is desirable before treatment is instituted. Ventricular tachycardia consists simply of many beats of ventricular origin occurring in series. Therefore, the QRS complex is increased in time (0.12 second or greater) and is bizarre in configuration. Since the ventricular pacemaker is firing without reference to higher centers, atrial beats (P waves) may be seen in changing relationship to the QRS complexes (AV dissociation). This phenomenon provides a graphic accompaniment to the changing first heart sound heard clinically. If ventricular tachycardia occurs in the presence of atrial arrest or atrial fibrillation, however, this sign will not be present (figure 1).

Several conditions may simulate ventricular tachycardia electrocardiographically. Perhaps the most common of these is supraventricular tachycardia, usually atrial in origin, when it occurs with altered ventricular conduction, including intraventricular block and right and left bundle-branch block. In these instances, however, AV dissociation is not present, and if P waves are discernible they occur in a fixed relationship to the QRS complexes. Moreover, fusion beats and interference dissociation

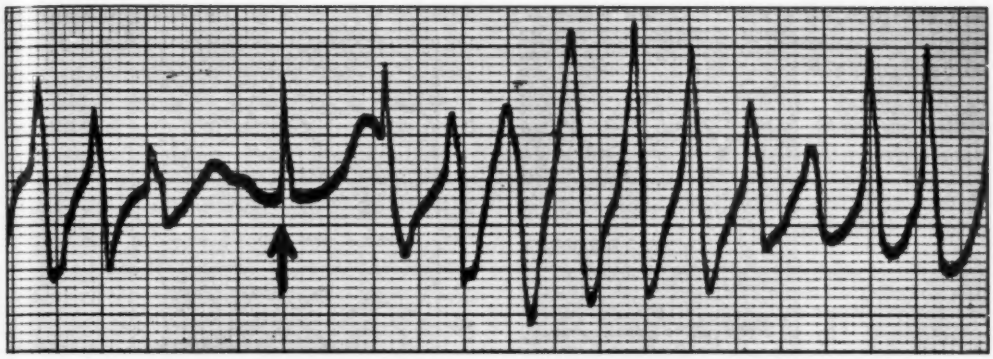

FIGURE 2. Electrocardiogram of a 25 year old man in whom organic heart disease was not suspected. Ventricular tachycardia appeared after he was admitted to the hospital for another reason.

Note the fifth QRS complex (arrow), which represents an instance of interference dissociation (ventricular capture). Following atrial systole (P wave), at a time when circumstances for conduction were favorable, a normally transmitted ventricular response was possible.

(ventricular capture), which facilitate the diagnosis of ventricular tachycardia, are not observed with these other conditions (figure 2). Finally, a response to carotid sinus stimulation signals the presence of an ectopic focus above the ventricles. If the usual 12 lead electrocardiogram fails to reveal P waves, an esophageal lead or a bipolar chest lead may clarify the situation.

In most instances of the Wolff-Parkinson-White syndrome (short P-R interval with an abnormal QRS complex) when a paroxysm of supraventricular tachycardia occurs, the ventricular complexes are normal. Occasionally, however, abnormal ventricular complexes are recorded and simulate ventricular tachycardia. If a previous record without tachycardia is available for comparison, it may be noted that the ventricular complexes (with the characteristic delta waves) are similar in spite of the different cardiac mechanism. Here, too, the absence of AV dissociation and a response to vagal stimulation will aid diagnosis.

Treatment

Procaine amide hydrochloride, administered intravenously, is the drug of choice in the treatment of ventricular tachycardia. Because of a short latent period with a maximal response four minutes after injection,[8] dosage of this drug may be titrated against effect much more exactly than can the dosage of intravenously administered quinidine, which has a maximal effect at least 10 minutes after injection.[9] With the latter drug, cumulative effects and toxicity are more likely.

One gram of procaine amide hydrochloride may be diluted in 100 cc. of 5 per cent dextrose in water and infused slowly (no faster than 5 cc. or 50 mg. per minute). Electrocardiographic control and frequent blood pressure determinations are necessary to detect early signs of procaine amide hydrochloride intoxication, including further irritative phenomena, heart block, and hypotension (figure 3). Should hypotension develop in the face of continuing need for therapy, intravenously administered vasopressors such as norepinephrine or metaraminol may prove helpful in maintaining blood pressure.

If the arrhythmia is well tolerated or of long-standing duration or if it occurs in the absence of underlying heart disease, orally administered therapy is preferable to that given intravenously. In these less urgent situations, orally administered quinidine sulfate or intramuscularly given quinidine gluconate may be employed. Toxicity is rarely observed when the daily dose of orally administered quinidine sulfate is 3.0 gm. or less.[10]

A word of caution concerning the use of these drugs is necessary. Both procaine amide

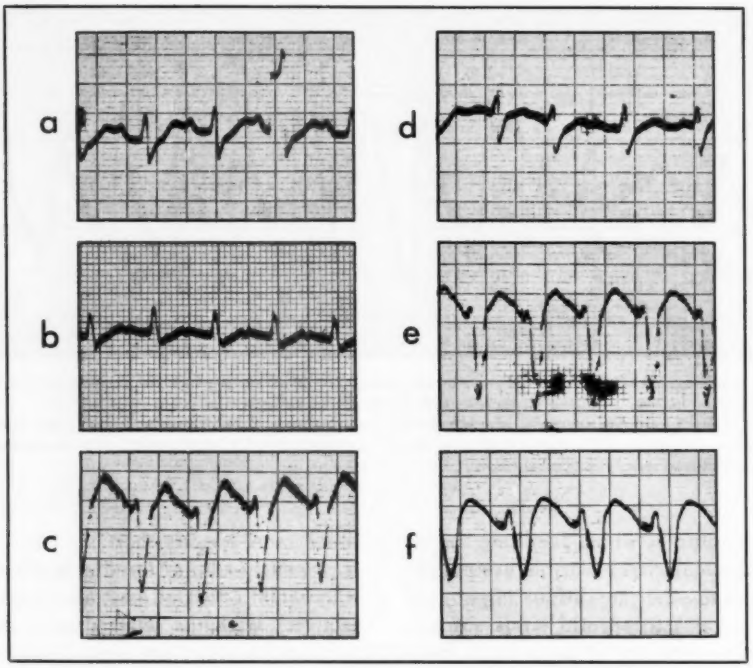

FIGURE 3. Electrocardiograms of an 80 year old man presumed to have a ruptured abdominal aneurysm. Shortly following his admission to the hospital, signs of congestive heart failure appeared.

Sinus tachycardia was present before and after treatment with a rapid-acting digitalis preparation (a). Within one-half hour, however, the P-R interval had increased (b), and then ventricular tachycardia appeared (c).

After 625 mg. NaEDTA was administered intravenously, atrial fibrillation appeared (d). Fifteen minutes later, ventricular tachycardia reappeared (e) and was accompanied by shock. At this time, NaEDTA was ineffective.

Whole blood had been administered without clinical change, and this treatment was continued. After 1.0 gm. procaine amide hydrochloride was given intravenously, widening of the QRS complexes was noted (f), and ventricular tachycardia persisted. Shortly thereafter, the patient died.

hydrochloride and quinidine sulfate are myocardial depressants. When the activity of an ectopic ventricular pacemaker is suppressed, it is hoped that the normal sinus mechanism will then activate ventricular systole. In certain cases, however, ventricular tachycardia may be superimposed on a pre-existing atrial arrest or complete heart block, and ventricular standstill may follow therapy with these drugs.[11] If the tachycardia threatens life, therapy is justified. An external cardiac pacemaker, if available, will provide some security in the face of this risk.

Disodium ethylenediaminetetraacetate (NaEDTA or sodium VERSENE®) also has been used with great success in treating a small number of cases of digitalis-induced ventricular tachycardia.[12] NaEDTA is a chelating agent which binds and lowers serum calcium. Since calcium and digitalis have a synergistic effect on the heart, the mechanism of action of NaEDTA is easily understood. It is used with 5 per cent dextrose in water diluted to a concentration of 20 mg. per cubic centimeter and given at rates of 5 to 25 cc. (100 to 500 mg.) per minute. Electrocardiographic control is advisable here, too, as a guide to the effects of therapy.

Potassium chloride infusion may reverse digitalis-induced ventricular tachycardia associated with potassium deficiency.[2] It is usually administered in a dilution of 40 mEq. per 1000 cc. of dextrose in water. The large quantities of fluid necessary for its administration, however, limit its use to patients in whom congestive heart failure is neither imminent nor present. Frequent determinations of potassium levels with a flame photometer and of effects with an electrocardiograph will guard against occurrence of the complications of hyperpotassemia.

In the past, digitalis has been contraindicated in the presence of ventricular tachycardia. Now, however, it is realized that if congestive heart failure is present and if digitalis has not been administered, this drug may be lifesaving.[4,13] The indications for its use are no different in the presence of ventricular tachycardia than in any cardiac arrhythmia. Since time is usually an important factor, the use of a rapid-acting preparation is preferable to using a more slowly acting one.

Other drugs employed less commonly in the treatment of ventricular tachycardia include magnesium sulfate,[1] DILANTIN® sodium[14] and morphine.[15] Although the rationale for their use is less secure, success has been observed, and, if other measures fail, these agents are worth a trial.

Summary

Ventricular tachycardia is a serious cardiac arrhythmia which requires prompt recognition and treatment. It is important to determine if the arrhythmia is due to intrinsic heart disease or if it is a manifestation of digitalis intoxication.

Treatment with procaine amide hydrochloride, administered intravenously, is preferred to quinidine sulfate therapy. The shorter onset of action of the former agent permits more exact titration of dosage against cardiac effect.

Disodium ethylenediaminetetraacetate, a calcium-chelating agent, and potassium chloride are particularly useful in the treatment of digitalis-induced ventricular tachycardia.

Digitalis is no longer contraindicated in the presence of ventricular tachycardia unless intoxication with this agent is suspected. If congestive heart failure is present and if digitalis has not been administered, this drug may be lifesaving.

The use of all of these drugs and others whose mechanism of action is poorly understood is discussed.

ACKNOWLEDGMENTS

I am indebted to Dr. Albert L. Rubin for permission to use the electrocardiograms presented herein; the electrocardiograms were collected in his department. Drs. Rubin and Burton D. Cohen also made several suggestions in the preparation of this manuscript.

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Medical Problems in Organization of an Athletic Program

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The heart of an athletic organization is a team made up of school administrator, head coach, team physician and trainer, whose members understand one another and carry out their individual functions capably.

Organized medicine, in recent years, has displayed a great interest in the field of athletics, resulting in many improvements in prevention and treatment of injury.

The time is ripe for the individual physician to associate himself with an athletic organization, particularly in the high school, where so many serious injuries occur which carry over into adult life.

ROBERT G. BRASHEAR

AMONG the many factors which have participated in the tremendous improvement in the prevention and treatment of injuries and diseases among athletes in the past 30 years, the two most basic ones probably have been the great increase in our population, with its impact on sports, and the improvement in education in general in our country. In the 1920s and early 1930s, organized medicine displayed practically no interest in athletics, and good medical care for athletes was available in only a few of the larger universities. Certainly the general interest of organized medicine in athletic problems in recent years has been a great influence in both prevention and treatment of athletic injuries. A better-informed public, however, has pinpointed the problem, so to speak, and brought pressure to bear, resulting in such developments as the constant upgrading of coaches at all levels and the increasing use of the "team physician" and the full-time lay trainer. Medical representation on the football rules committee is also a great step forward, and even the keen interest of commercial agencies such as manufacturers of athletic equipment and

FIGURE 1. This organizational scheme can be thought of not as a line drawing but as a polyhedral metal sphere, put together many years ago with many rough corners and facets.

Having been "kicked around" all these years, from coach to doctor to school administrator, and so on, all the rough corners have been smoothed, and since organized medicine has taken a hand the organization sphere has begun to show a certain luster; just a bit more hand polishing should make it a thing of beauty.

certain chemical manufacturers has done much to promote sports safety (figure 1).

The heart of an athletic organization is *a team* made up of the school administrator, the head athletic coach, the team physician and the team trainer. The members of this team must understand and believe in one another completely.

The School Administrator

The school administrator, be he called president or principal, is responsible to the parents for the welfare of their sons and daughters. It is well for the school administrator to arrange for the services of a team physician and a trainer and make them directly responsible to him and not to the athletic department. This arrangement would, in many instances, relieve the trainer and even the team physician from the pressure sometimes applied by a "desperate" head coach badly in need of the services of an injured athlete. Since it is a well-accepted fact that the head coach actually holds the key to the prevention of athletic injuries, it behooves the school administrator to select him with great care.

The Head Coach

The head coach of any athletic team must be a natural teacher and a natural leader of men. All the other qualities we look for in coaches are secondary to these. The head coach, through the school administrator, is responsible for raising sufficient money to provide facilities to carry out a modern athletic program as well as for maintaining them in a safe and sanitary condition. He arranges the various athletic schedules and certainly should not pit a superior football team against an inferior one. It is he who selects the athlete and places him in his proper position. He develops the skill and teaches the technics that must be mastered to excel in any athletic contest. He must develop the strength and stamina to outdo and outlast the opponents; and he must weld athletes of different temperament and varying abilities of skill into a team unit. To accomplish these tasks the coach must be the "head man" of the organization. We must all remember that the head coach is expected to win (at least in the American way of life). He must not lose. It becomes a problem of his

"bread and butter." I mention this point because it is sometimes not appreciated by the irritated team physician. The head coach must be tough. Otherwise, a large percentage of his players would "gold brick" during the week and only be ready to perform on Saturday. Under this tough exterior of the head coach, however, if we look, we are apt to find a lot of real understanding and sympathy.

The Team Physician

Every athletic program needs *one* team physician, not a group of physicians with a different one in attendance every week. In a general way, the duties of the team physician may be described under three headings: consultant, active participant and teacher.

Consultant—As a consultant, the team physician helps the school administrator and the coaching staff with general problems such as sanitation and hygiene and with many specific problems such as special exercises, diets, normal athletic equipment, and special protective equipment. The coaching staff usually needs advice of a medical nature many times, and in most instances the doctor need not be a specialist in athletics. Indeed he need never have participated as a player to answer most of the questions. "How much water should an athlete be given during practice and during a game?" "Should salt be added to the water in hot weather?" "Should athletes be given sugar or any other stimulant?" "How can we best put weight on one boy and take weight off another boy?" Many questions such as these are forthcoming from our coaches, and obviously most of them can be answered by any doctor.

Active participant—As a direct participant in the athletic program the physician serves in two principal capacities. He conducts the preseason physical examinations and makes the proper disposition of every athlete, and he is available during athletic contests and, if possible, at every practice session. His presence in the latter situation is very important, since the decision to remove a boy from practice or to return him to practice is, quoting Dr. Robert Quigley of Harvard University, "a medical decision" and should be made by a doctor if possible.

The physical examination of the first-year participant is very important. It must be very thorough, and complete records must be kept of the findings and must be available to the coaching staff and the trainer; past illnesses, immunizations and injuries are very important. This examination cannot be made properly if the athlete is clothed.

Occasionally, an athlete will be disqualified from participation in sports on the basis of this examination. The team physician, particularly at the college level, should be very careful about disqualifying an athlete without adequate consultation. Every American boy or girl has the right to participate in some form of athletics, and indeed in many instances the athlete plans to make it his life's career; such a person must not be disqualified on the basis of any one opinion.

The team physician must be ready to treat the acute injury and also to protect against recurrence of an old injury. He must be willing to permit the injured athlete to resume practice, or some part of practice, at the earliest possible moment and yet must not risk permanent disability as a result of re-injury. If he does these things, he has developed what we call the "athletic attitude," which is an important part of the team physician's philosophy. Actually, if the doctor is not willing to let a boy return to practice until he is entirely well, the coaching staff does not need the physician's services, for the coach probably can determine this himself.

Teacher—Teaching the trainers (and the coaching staff) is a most important function of the team physician. Ordinarily, the trainer is charged with the prevention of injury, while the doctor is charged with diagnosis and treatment. As one of our outstanding trainers has put it, "we are suspecticians, and the doctors are diagnosticians." However, a good trainer can take over many of the doctor's functions if and when the doctor is willing. We urge particularly that the trainer have access to cadaver material and that he be taken into the operating room so that he may see living structures. No textbook picture can give a trainer (or anyone else) an idea of living tissues, much less of injured tissues. Let him see the blood!

As he matures, give him more responsibility. Always criticize him in private and always compliment him in public.

The Trainer

The full-time trainer represents the greatest advance in organized athletics in the past 25 years. He has evolved from a nobody with a bottle of arnica to a highly regarded medical technician, largely due to the development of the National Athletic Trainers' Association, which was organized 10 or 12 years ago and has become a fine and highly ethical group of almost 600 members representing the entire United States and parts of Canada. This organization meets annually for the express purpose of the free interchange of information. The membership comes primarily from colleges and professional athletics but already includes a few names from forward-thinking high schools.

Several years ago this organization approached the Secretary of the American Medical Association seeking recognition as medical technicians. They received encouragement and advice. As a result, they drew up a college curriculum as a minimal basic requirement for membership. The members have accepted this curriculum unanimously, and it has been passed on by many outstanding educators in this country. Roughly it consists of a major in one of the basic sciences and a minor in physical education. Armed with this degree, the prospective trainer will be assured of a teaching assignment in his own state, and indeed in any state. This college graduate is urged to continue postgraduate study in physical therapy, and several trainers have obtained the degree of Master or of Doctor of Philosophy in this field. Already a Board of Certification is being formed to control the standard of education of trainers.

I urge all team physicians to attend at least one meeting of the National Athletic Trainers' Association in order to learn at firsthand the problems confronting trainers and coaches. The programs and dates of these meetings can be obtained from Mr. "Pinky" Newell, Purdue University Athletic Association, Lafayette, Indiana.

A Reminder - - -

1960 Interstate Postgraduate Medical Assembly

Pittsburgh-Hilton Hotel

Pittsburgh, Pennsylvania

OCTOBER 31-NOVEMBER 3

Stramonium Poisoning

SOLOMON WEINTRAUB*

St. Francis Hospital, Trenton, New Jersey

Stramonium poisoning, caused by the ingestion or infusion of parts of the plant Datura stramonium, has a wide geographical distribution and a long history. It first appeared in this country in 1676 and since has occurred sporadically. The author reviews three cases of stramonium poisoning in children. Treatment consisted of gastric lavage and administration of small doses of phenobarbital and 5 per cent glucose in saline.

Case Reports

SOLOMON WEINTRAUB

ON September 22, 1959, three children were brought in rapid succession to the emergency room of St. Francis Hospital in Trenton, New Jersey. The first of these patients, aged three and one-half years, was said to have been sitting at the dinner table when she suddenly vomited and began "shaking all over"; she then fell from her chair and was unable to get up. In the emergency room the patient was restless; she struggled, cried in a peculiar voice, and appeared dazed. Her past history as given by her father revealed no previous similar incident. The only positive findings on physical examination in the ward were dilated pupils, which did not react to light, and dryness of the lips and tongue.

The second child, aged four years, was brought to the hospital by his mother two hours later. At home the boy suddenly became restless and began crying; he was frightened and unable to recognize anyone. At the hospital the child was found to be unable to walk or talk and acted somewhat delirious. Physical examination showed that he also had dilated pupils, which did not react to light.

About one-half hour later, the third child, aged two years, was brought to the hospital by his aunt. She stated that he had had the same symptoms as those described in the first two patients, namely, screaming, hallucinations and inability to recognize anyone. This child was a cousin of the first patient and a brother of the second patient.

Further questioning revealed that the three children had been playing together in the back yard of their home, and all had eaten

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Presented before the second International Meeting of Forensic Pathology and Medicine at New York, September 1960.

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part of a plant growing there. The police were sent to bring the plant to the hospital. It had beautiful white, trumpetlike flowers on long stems, to which were attached small green, spine-covered placentae. Part of one placenta had been chewed away, and the seeds therein were exposed. The leaves on the stems were dark green with pointed, indented margins. The plants were identified as angel trumpet, biologically known as *Datura stramonium* and also called Jimson weed or Jamestown weed.

Laboratory findings—Throat cultures in all three patients showed nonhemolytic streptococci. Results of the VDRL test were negative. In the first patient, chemical analysis and subsequent bacteriologic studies of the spinal fluid showed no pathologic findings. The blood counts in all three patients were within normal limits.

Treatment—All three children received the same treatment, namely, gastric lavage, sedatives in the form of small doses of phenobarbital, and 5 per cent glucose in saline administered intravenously and by clysis. The children made an uneventful, rapid recovery and were discharged three days later with a diagnosis of stramonium poisoning due to ingestion of seeds of *D. stramonium*.

History of Stramonium Poisoning

Stramonium poisoning, due to ingestion of different parts of the plant *D. stramonium* or to receiving its by-products in the form of infusions or tea, is said to have made its first appearance in this country in 1676. The plant was known to the Indians as the "white man's plant," indicating that it was imported into this country by the Europeans.[1,2] There is reference to the use of the plant for poisoning in Homer's "Odyssey" (book 10):

> Therewith the slayer of Argos gave me the plant that he had plucked from the ground, and he showed me the growth thereof. It was black at the root, but the flower was like to milk.

In Shakespeare's "Romeo and Juliet" (act II, scene 3), Friar Lawrence says:

> I must up-fill this osier cage of ours with baleful weeds and precious-juiced flowers . . . . within the infant rind of this small flower poison hath residence, and medicine power: For this, being smelt, with that part cheers each part being tasted, slays all senses with the heart.

In "Antony and Cleopatra" there is mention that this plant was employed by Cleopatra in her famous wooing of Caesar. It is also of interest to note that the plant played a part in the life story of one of the world's great leaders, Mahatma Gandhi.[3] In his autobiography he described his attempt to commit suicide with one of his playmates as follows:

> But how were we to do it? From where were we to get the poison? We heard that "*Dhatura*" seeds were an effective poison. Off we went to the jungle in search of these seeds, and got them.

In 1848, Griffith[2] described the use of this weed in Russia to increase the intoxicating effect of beer, and mentioned the long history of its application by assassins in the time of Omar Khayyám. As early as 1856, Chevers,[4] describing his experiences in India, wrote of the "professional poisoners" as thugs who used this weed in their criminal escapades.

In American colonial history there is a very detailed description of an incident at the time of the Nathaniel Bacon rebellion against the colonial government of Virginia under Sir William Berkeley. Some British soldiers were sent into Jamestown to put down the rebellion. The incident is reported as follows:[5]

> . . . it was gathered very young, for a boiled salad by some soldiers sent thither [Jamestown] to quell a rebellion of Bacon: and some of them ate plentifully of it: the effect of which was a very pleasant comedy, for they turned natural fools upon it for several days. One would blow a feather up in the air, another would dart straws at it with much fury: another, stark naked, was sitting up in a corner like a monkey, grimacing, etc.

This effect lasted 11 days, after which the soldiers recovered without recollection of what had happened. This may account for the fact that the plant *D. stramonium* is called Jamestown weed.

From medical case reports it is seen that this plant has a broad geographical distribution and a long history. In addition to cases

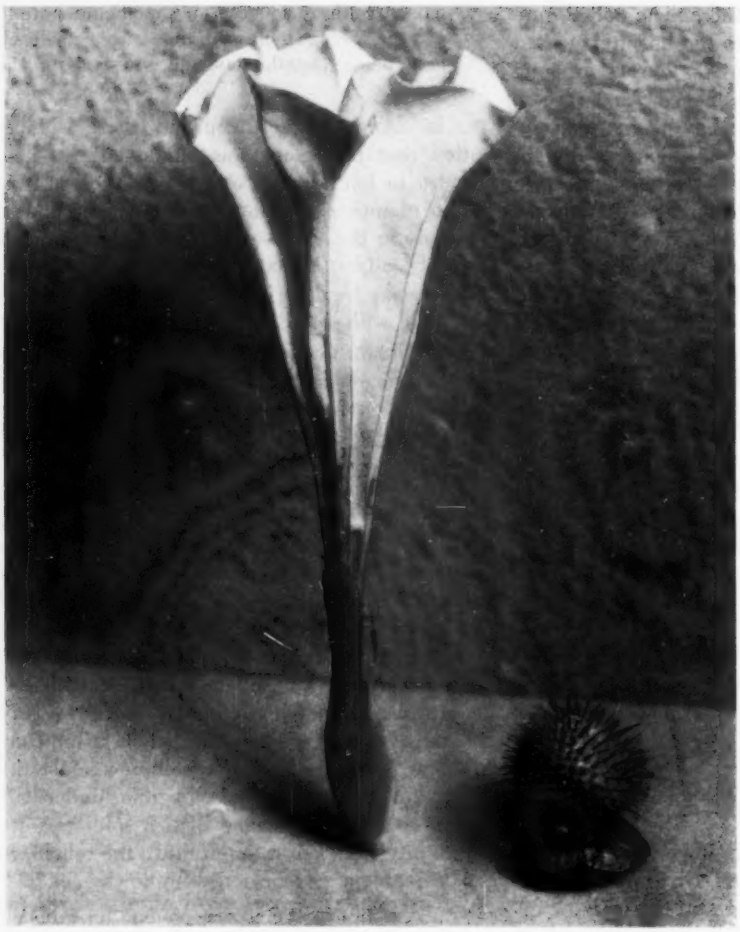

FIGURE 1. *Datura stramonium* plant.

(Courtesy of *Trenton Times*, Trenton, New Jersey.)

of stramonium poisoning reported from different parts of the United States and Canada, many reports have come from India, Egypt, France, Australia, Uruguay, Austria and the Netherlands.[6-16] In 1915, Ismael[7] listed the incidence of stramonium poisoning as second to alcoholic intoxication in unconscious patients found in the streets of Cairo and brought to Karr-el-Amy Government Hospital.

In 1955, a review of the patients admitted to the Pediatric Service of the University of Virginia Hospital[16] revealed that the incidence of Jimson weed poisoning was the same as the incidence of lead, barbiturate, rodenticide and insecticide poisoning.

Toxicology

The plant *D. stramonium* is known in many countries under different names. In France it is called *Pomme epineuse;* in Italy, *Stramona;* in Germany, *Steckapful;* and in this country it is referred to as thorn apple, devil's apple, Jamestown weed, Jimson weed and angel tulip. It grows wild in the United States. The plant reaches heights of from 3 to 6 ft. and has many dark green sessile leaves about 5 in. in length. The leaves are pointed and have indented margins. The flower is white and trumpet-shaped, with five lobes; its beauty is eye-catching (figure 1). It has a central pla-

centa with a small, spine-covered fruit, within which are innumerable seeds. All parts of the plant have an unpleasant, narcotic smell and a bitter, nauseous taste.[1,2] The plant is a member of the *Solanaceae* or nightshade family, which includes tobacco, tomato plants, belladonna and bittersweet.[8] When ingested directly or taken in the form of infusion or tea, it produces skin flushing, tachycardia, dryness of mouth and skin, excitement, delirium, irritability, fever, convulsions, depression and bilateral mydriasis. Unilateral mydriasis has been reported in farmers working with corn pickers or combines.[16] One death, caused by inhalation of the "vapor" of a full-blown flower in a closed room, has been reported.[14] Infusions prepared from the leaves and smoking of cigarettes made of the dried leaves have been used medicinally in the treatment of asthma.[1,2] The ingestion of about 4 to 5 gm. of the leaves or seed is said to be fatal.

Stramonium, which can be abstracted from the plant, crystallizes as long, colorless needles. Taylor[14] stated that 1/8 gr. killed a sparrow in three hours. When heated, the crystals release ammonia. The drug is soluble in boiling water and its solution is alkaline in reaction. The drug may be precipitated out of solution by tannic acid, potassium chloride and mercury chloride.

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Postgraduate Clinical NOTES

147. THE FUTURE OF THE AGED

In medicine we have yet to adapt our vision to the change in expectation of life in the last half-century. Our thinking about the prognosis of illness or the effects of treatment is narrowly focused upon the few years that follow. The time has long since arrived when we should be asking ourselves how this man of 40 will fare with his neurosis or duodenal ulcer or without his frontal lobes or his stomach at 65. We shall have, in fact, to cultivate the habit of asking the question, "What is this neurotic and eccentric or bronchitic and hypertensive person of 40 going to be like at 70, and what can be done to protect him against the possibility of an old age darkened by loneliness and depression and mental or physical infirmity?"

M. Roth, Problems of an ageing population,
British Medical Journal, April 23, 1960, pp. 1226-1230

CASE REPORT

Primary Hyperparathyroidism With Acute Parathyroid Hormone Intoxication

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Early diagnosis of primary hyperparathyroidism is desirable to minimize complications involving bone, kidneys, gastrointestinal tract and pancreas.

The danger of procrastination once the diagnosis is established lies in the possible development of visceral complications and the so-called hypercalcemic crisis.

In the case reported, renal and gastrointestinal complications due to parathyroid adenoma were present.

Prompt surgical treatment may reverse the renal failure in some cases.

PRIMARY hyperparathyroidism was first recognized as a clinical disease entity in 1926.[1] At that time, it was recognized as a disease involving bone. It was subsequently learned that it could involve the urinary tract[2,3] and the gastrointestinal tract.[4,5] More recently, Cope and co-workers[6] and Hoar and Gorlin[7] have demonstrated that the disease also may involve the pancreas.

SAMUEL SPINNER

I shall report a case of primary hyperparathyroidism in order to emphasize the clinical manifestations and the so-called hypercalcemic crisis.

Case Report

A 62 year old railroad welder first was admitted to the hospital in October 1955, because of an uncomplicated duodenal ulcer. Roentgenologic examination of the gastrointestinal tract incidentally disclosed calcification in the region of the left kidney.

In January 1956, the patient was hospitalized for colic in the left ureter, which required a ureterolithotomy. Roentgenologic examination showed calcification in the region of both kidneys. An intravenous phenolsulfonphthalein test revealed that 20 per cent of the phenolsulfonphthalein solution was excreted in 15 minutes. The result of a Sulkowitch test

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on the urine was strongly positive. The urinary excretion of calcium and phosphorus was determined after the patient had been on a low-calcium diet for three days. The 24 hour specimen of urine contained 360 mg. of calcium (15 mg. per 100 ml.) and 864 mg. of phosphorus (36 mg. per 100 ml.).

The value for the nonprotein nitrogen of the serum was normal. Total serum protein was 7.0 gm. per 100 ml., and the albumin-globulin ratio was 4.2:2.8. Uric acid was 5.7 mg. per 100 ml. of serum. The values for serum calcium and serum phosphorus determined on three occasions were: serum calcium 14.0, 13.3 and 15.6 mg. per 100 ml.; serum phosphorus 2.0, 2.2 and 2.2 mg. per 100 ml.

The patient was urged to undergo a parathyroid operation, but he refused to do so.

The patient was admitted to the hospital for the third time in March 1957, because of a massive hemorrhage from the upper part of the gastrointestinal tract. Three pints of blood were necessary for replacement transfusion. Roentgenologic examination again revealed a duodenal ulcer. The value for the serum calcium was fairly normal, and that for the serum phosphorus was still low. On two occasions, the values for the serum calcium were 9.4 and 11.6 mg. per 100 ml., respectively, and those for the serum phosphorus were 2.0 and 2.4 mg. per 100 ml., respectively.

In February 1958, the patient was admitted to the hospital for the fourth time, because of the progressive development of symptoms during the previous two weeks. These symptoms consisted of weakness, drowsiness, and low back pain which extended down the anterior portion of the thighs. When the patient was admitted to the hospital, he was very drowsy and so weak that he hardly could sit up. The blood pressure was 150 mm. of mercury systolic and 70 mm. diastolic.

The specific gravity of the urine was 1.006, but the urine otherwise was normal. The result of a Sulkowitch test was 4 plus. A culture of the urine was negative. The patient was able to concentrate urine to a specific gravity of 1.009. An intravenous phenolsulfonphthalein test was performed. Less than 5 per cent of the phenolsulfonphthalein solution was excreted in 15 minutes, 10 per cent was excreted in 30 minutes, and 13 per cent was excreted in one hour.

The blood count was normal. On two occasions, the values for the nonprotein nitrogen of the serum were 48 and 64 mg. per 100 ml., respectively. The serum sodium was 134.6 mEq. per liter, serum potassium 4.1, serum carbon dioxide 27.7, and serum chloride 109. The value for the serum calcium was 16.4 mg. per 100 ml., and the serum phosphorus 3.1. The total serum protein was 8.0 gm. per 100 ml., and the albumin-globulin ratio was 4.4: 3.6. The value for the serum alkaline phosphatase was normal.

Roentgenologic examination did not reveal any evidence of skeletal involvement. The lamina dura about the teeth was intact. Roentgenologic examination of the esophagus with barium revealed what probably was an extrinsic pressure defect on the right side at the level of the thyroid gland.

The patient consented to undergo a parathyroid operation, and he was transferred to the service of Dr. Oliver Cope and his coworkers. A large tumor of the right upper parathyroid gland was excised. The tumor measured 3.5 by 2.5 by 2 cm. and was an adenoma. The patient made a rapid recovery. After a suitable convalescent period, the patient returned to his former arduous work and was free of symptoms. Table 1 shows the results of laboratory tests before and after operation. A preoperative test of tubular reabsorption of filtered phosphorus revealed that 47 per cent of filtered phosphorus was reabsorbed. The normal reabsorption is 91 plus or minus 3 per cent.

Comment

The diagnosis of primary hyperparathyroidism can be made very easily in cases in which involvement of the bones or kidneys produces symptoms that lead to roentgenologic examination or the use of chemical tests. Roentgenologic examination may reveal the so-called moth-eaten skull, subperiosteal cysts, the so-called codfish vertebrae, absence of the lamina dura, esophageal indentation, and renal calcification. Chemical tests may disclose hy-

TABLE 1

LABORATORY DATA

1958	BLOOD					URINE		
	Calcium (mg.)	*Phosphorus (mg.)*	*Nonprotein nitrogen (mg.)*	*Creatinine (mg.)*	*Alkaline phosphatase (Bodansky units)*	*Calcium (mg.)*	*Phosphorus (mg.)*	*Creatinine (mg.)*
March 3	18.4	3.1	44	1.8	5.5	27.6	41.5	0.46
March 5	17.6	3.1	41					
March 6	Excision of parathyroid adenoma							
March 8	10.9	2.2		1.4				
March 10	9.6	2.7		1.4				0.72
March 12	8.8	2.3						
March 18	8.8	2.7		1.3			40	1.08
March 19	8.0	2.4						
May 5	10.2	2.2	30					

percalcemia, hypophosphatemia, hypercalciuria, hyperphosphaturia and a decrease in the reabsorption of filtered phosphorus by the renal tubules.

In a group of reported cases of hyperparathyroidism without obvious involvement of the bones or kidneys, the diagnosis was made on the basis of the suspicion raised by symptoms attributable to hypercalcemia alone.[8] These symptoms included muscular weakness, hypotonia, nausea and vomiting, anorexia and constipation. Although such early diagnosis is desirable in order to prevent permanent injury that may occur in the bones, kidneys, pancreas and gastrointestinal tract, it can be made only if the physician has an extremely high index of suspicion in all cases in which patients have symptoms that are not characteristic of any specific disease. If the correct diagnosis is not made in such cases, the patients may be considered neurotic.

The present case illustrates a common problem of the clinician, that is, the difficulty in obtaining the consent of the patient to undergo an operation after some complicating disease has subsided. In this case, neither an episode of ureteral colic nor a massive hemorrhage from a duodenal ulcer could convince the patient that an elective operation on the parathyroid gland was necessary to prevent further trouble. However, when the patient became so ill that it was apparent that he could not survive without help, he consented to an operation.

At the time of the operation the patient presented a serious clinical problem. It was a question whether the stress of the operation would aggravate the existing renal failure and cause death, or whether the renal dysfunction could be improved even if the patient survived the operation.

In 1934, Albright and co-workers[2] classified the renal involvement in hyperparathyroidism into three types. Type 1 consists of pyelonephritis secondary to the formation of calcium phosphate stones in the renal pelves. Type 3 consists of acute parathyroid poisoning associated with anuria and calcium deposits in the renal parenchyma as well as in other organs. Chronic changes do not occur in this type of the disease. Type 2 consists of a pathologic condition midway between that in type 1 and type 3. It simulates both chronic glomerular nephritis and vascular nephritis. This type differs from type 1 in that the deposits are in the renal parenchyma rather than in the renal pelves. It differs from type 3 in that long-standing changes are present in the

kidney and the calcium deposits may be limited to the kidney. These authors considered the term nephrocalcinosis descriptive of this type. The renal lesions in the present case probably can be classified as type 2.

In a recent paper, Edvall[9] considered the disturbance in renal function in cases of hyperparathyroidism. He divided the functional renal changes into two types. The first type, which can be reversed by removal of overactive parathyroid tissue, includes: (1) a decrease in tubular reabsorption, (2) a marked increase in the glomerular filtration rate, and (3) a less marked increase in the renal plasma flow. The second type consists of a decrease in the excretory function of the renal tubules, which is irreversible by removal of overactive parathyroid tissue. Edvall also emphasized that parathyroidectomy may result in a fatal loss of compensatory renal hyperfunction in cases in which advanced lesions are present in the kidneys. Törnblom[10] discussed just such an unhappy result. In the present case, the renal function fortunately was adequate for the stress of the operation, and adequate renal function has been maintained since then.

On the occasion of the patient's fourth admission to the hospital, the weakness and lethargy were so striking and had developed so quickly that we considered the possibility of an acute parathyroid hormone intoxication, sometimes called hypercalcemic crisis or hyperhyperparathyroidism. In an excellent discussion of acute parathyroid hormone intoxication, Horowitz and Berenbaum[11] said that this complication had occurred in only 10 cases previously reported in the literature, and that it could occur when the concentration of serum calcium reached 17 mg. per 100 ml. or higher. A failing renal function and an increasing concentration of serum calcium constitute the danger signals. It was emphasized that the prompt intravenous administration of fluids to combat hemoconcentration, followed immediately by operation, seemed to be the only treatment indicated for this syndrome.

After the diagnosis of hyperparathyroidism has been established, the danger of procrastination lies not only in the possible development of visceral complications but also in the possible development of the endocrinologic crisis known variously as parathyroid hormone intoxication or hypercalcemic crisis. Prompt surgical treatment may reverse the renal failure in some cases.

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SYMPOSIUM

The Place of Oxytocics in Obstetric Practice

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AND JAMES E. FITZGERALD[3]

The elective induction of labor is an acceptable practice providing all the proper conditions are met, but it does entail certain pitfalls and in some instances could be termed meddlesome obstetrics. The incidence of "induction of convenience" should be low.

The place of oxytocics in many other situations is discussed, including the management of the third stage of labor, toxemia, placenta previa, breech presentation, diabetes, heart disease, desultory labor and postmaturity.

DR. HERBERT E. SCHMITZ (Moderator): I have waited many years for the opportunity I have here today. I was a student of both my fellow participants, and I never had a chance to talk back to them. My associates in this panel discussion are Dr. Jack Greenhill, who probably is better known for his "Year Book of Obstetrics and Gynecology" than for all his other honors and positions, and Dr. Jim Fitzgerald, who for years has headed the department of obstetrics and gynecology at Cook County Hospital and who is professor of obstetrics and gynecology at Northwestern University Medical School.

When we were asked to present this panel discussion, the subject immediately appealed to me because of the great importance of the use of oxytocics in obstetrics. It is a topic which could surely occupy us for most of the afternoon. We have not rehearsed what we will say, and I believe the spontaneity of the program will add to its success. Of course, the momentum, importance and interest of such a presentation is directly proportional to the participation of the audience, and I hope the audience here will submit to the panel any problems and questions they may have, and one of the two experts will answer them.

Oxytocics in the Third Stage of Labor

"Oxytocic" means to hurry labor, and today the greatest interest in the medical literature

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seems to involve the use of PITOCIN® to hurry labor. Almost everyone who practices obstetrics uses an oxytocic in the third stage of labor. Here is where it had its beginning uses and its greatest importance. Dr. Fitzgerald, what do you think is the place of Pitocin, if you use Pitocin as an oxytocic, in the management of the third stage of labor?

DR. JAMES E. FITZGERALD: As you know, there are two schools of thought in this regard. At Lying-In Hospital, I think an oxytocic is still given at the time the shoulders are delivered. Many of us do not give an oxytocic until after the baby is delivered, and some of us do not give it until the placenta is delivered. There are reasons for this. One is the fear of a trapped placenta. Whether or not this has anything to do with the time at which an oxytocic is given is probably open to argument, but a great percentage of us in Chicago give the drug after the placenta is delivered, probably because we fear retention of the placenta. This fear may be unfounded. It is perfectly possible and reasonable that if the placenta were delivered at the time it was separated from the uterus there would not be any trapping of the placenta whether one used an oxytocic or just waited until the placenta was delivered.

There seems to be no great need to give an oxytocic early. A uterus which has behaved like a good soldier all through labor should not suddenly be treated as a delinquent just because the third stage has arrived. I know that at Lying-In Hospital an oxytocic still is given, and I don't know what Dr. Greenhill himself does but I use it after the placenta is delivered.

DR. SCHMITZ: There was a time when we didn't have these things available or we didn't use them. We were taught the spontaneous management of the third stage of labor. We waited. We occupied our time with other matters until the uterus underwent a contraction. As it rose up again it was evident that it was in contraction, and we slid the placenta out or we let it come out very normally, let us say, and then, if there was relaxation or bleeding we used an oxytocic. Do you ever conduct a normal third stage of labor without the immediate use of an oxytocic?

DR. FITZGERALD: Yes, I frequently do just what you have suggested as an ancient custom of waiting to see how the uterus behaves; if nothing is needed, I let it alone. The time of delivery of the placenta is open to such argument that the practice ranges from that of one of the men at Lying-In Hospital who removes it manually in almost every case to waiting a reasonable length of time for the placenta to deliver itself. Two or three years ago at the Chicago Gynecological Society this question was raised by someone who wanted a vote from the Society as to when the placenta should be removed. The consensus was that nothing should be done for an hour after the patient had delivered the baby, but a small number of the members said they removed the placenta manually immediately and others said they waited for what most of us thought was an unreasonably long time for the placenta to deliver itself or separate itself and be easily delivered.

DR. SCHMITZ: Dr. Greenhill, do you think there is any advantage in using an oxytocic other than to hurry the third stage of labor?

DR. J. P. GREENHILL: Yes, to diminish the amount of bleeding. Dr. Schmitz mentioned the history of the use of oxytocics; he talks like an old man, although he admitted at the beginning that I am older than he. The history of the use of preparations to contract the uterus is a fascinating one, and anyone interested in it should read the writings of Moir of Oxford, England, who has written particularly concerning the development of the ergot preparations.

Everyone has his own personal impressions

about the need for oxytocics. Dr. Fitzgerald mentioned his fear of contraction of the uterus which would prevent expulsion of the placenta. On the other hand, if you believe statistics, data from various parts of the world, particularly the United States and Great Britain, prove (1) that there is a definite diminution in the amount of blood lost in the third stage of labor and (2) that the incidence of retention of the placenta is very low following the use of an oxytocic.

We must bear in mind the physiologic aspects of separation of the placenta. It has been shown conclusively that in the Rhesus monkey the placenta is almost completely separated in the second stage of labor; when the baby monkey is delivered, the placenta is with it. In human beings also, physiologic placental separation often begins toward the end of the second stage.

There is an obstetrician in New York who has done five or six thousand manual removals of the placenta over the last 25 years. He was one of the pioneers in this radical procedure. He inserts his hand into the uterus immediately after the baby is born, and he insists that there is separation of the placenta in the vast majority of cases. In my practice I almost routinely administer METHERGINE® or ERGOTRATE® with the delivery of the anterior shoulder.

DR. SCHMITZ: To interrupt you for just a moment, Dr. Greenhill, haven't a number of reports appeared in the literature stating that whether one does not use an oxytocic or an ergot derivative, or uses one of the weaker diluted solutions, or gives the full-strength product there is little difference in blood loss unless the patient is a potential bleeder?

DR. GREENHILL: No. I think there is definite proof that blood loss following the use of Methergine or Ergotrate is less. I do not mean that leaving expulsion of the placenta to nature, as we did for many years, results in *severe* bleeding. I think the average patient in labor can easily tolerate the extra loss of blood. What I am saying is that it helps most parturients to give an oxytocic. I find no fault with anyone who does not use these drugs.

DR. SCHMITZ: Then your combined opinion is that oxytocics are valuable drugs and should be used in the management of the third stage of labor?

DR. FITZGERALD: I would think so, and I would like to say one more thing here. All of you who watch labor-room procedures will notice that the mother is cared for very accurately up to the time the baby is delivered, and then she is forgotten and everybody watches to see how the cord is tied, and so on, and nobody watches the mother. I think there would be fewer so-called trapped placentas and probably less bleeding if more attention were paid to the mother as soon as possible after the baby is born, instead of allowing her to fend for herself until the baby is cared for and put in an incubator with proper oxygen and proper heating units—and the various things babies seem to need to survive in this day and age.

Indications for Oxytocics in Induction of Labor

DR. SCHMITZ: We agree that Pitocin has a place in the management of labor. Does it have a place in induction of labor? In recent years, both the lay press and the medical literature have devoted a good deal of space to discussions of "Tuesday and Thursday obstetrics" or obstetrics of convenience. First let us consider the place of Pitocin in induction of labor in a case in which there is toxemia or placenta previa or some other complication and it is decided that the baby should be delivered. Dr. Greenhill, do you employ this procedure?

DR. GREENHILL: I do employ intravenous pituitary drip for induction of labor, but not very often.

DR. SCHMITZ: How do you set up the intravenous drip?

DR. GREENHILL: We generally use 5 minims in 500 ml. of 5 per cent glucose solution. We start with 12 drops per minute for the first half-hour, so that only ¼ minim is given in 30 minutes. From then on we speed up the infusion to 50 drops per minute, giving approximately 1 minim each half-hour. The thing that is important, and I think is a rule now in every hospital, is that *a doctor must be*

with the patient all the time the infusion is running. We have learned the importance of this rule through sad experience. There have been occasional deaths from the use of pituitary extract even when given intravenously.

Now, may I offer one word of admonition. There are many lawsuits against obstetricians, and they are increasing in number. It won't be long before there will be lawsuits because of induction of labor if anything goes wrong either after rupture of the membranes or after the use of Pitocin.

DR. SCHMITZ: You mentioned amniotomy along with the use of Pitocin. Is that your usual practice?

DR. GREENHILL: I prefer amniotomy to the use of Pitocin, and in most cases that is all I use.

DR. SCHMITZ: You don't combine them as a general rule?

DR. GREENHILL: No, only if labor does not start six hours after amniotomy; then I start Pitocin drip.

DR. SCHMITZ: Dr. Fitzgerald, what are your thoughts on using oxytocics to induce labor?

DR. FITZGERALD: Labor will start eventually after the membranes are ruptured, but, as all of you know, in many patients the membranes rupture at or near term and a week later labor still has not started. Dr. Greenhill gives Pitocin after six hours; we give it earlier than that. We rupture the membranes and give Pitocin in a couple of hours if contractions have not occurred. I don't know how one can decide just when to give it; it depends on how much trouble you think there might be with the use of Pitocin. There are pitfalls to its use, there is no question about that. We use a weaker solution of Pitocin than Dr. Greenhill does. We use 2 or 3 minims in 1000 ml., and we start the drip running slowly, as he does, and increase it if necessary. An amazingly small amount of an oxytocic will initiate contractions. We do not think that an oxytocic does any particular damage, but, as Dr. Greenhill mentioned, if anything goes wrong there is no question about what may happen—and things have gone wrong with the use of oxytocics for inducing labor. I am sure there are more deaths than ever are reported.

DR. SCHMITZ: In performing amniotomy, do you think that stripping of the membranes is important before rupturing them?

DR. FITZGERALD: We always strip them and rupture the membranes and hold the head up enough so that a reasonable quantity of fluid drains from the uterus. If one just ruptures the membranes without allowing a reasonable amount of fluid to drain out of the uterus, it is much less likely that the amniotomy will produce the desired result than if one strips the membranes and ruptures them and allows fluid to drain. Labor usually ensues fairly promptly or very easily with a minimal amount of stimulation.

DR. SCHMITZ: Some physicians have suggested stripping the membranes on two or three succeeding days instead of amniotomy. Dr. Greenhill, what do you think about that?

DR. GREENHILL: I do not do it, and I would oppose it for psychologic and economic reasons. I do not see why we should keep a patient in the hospital two or three days and use an uncertain method when we have a certain one. I agree that in some cases just stripping the membranes will start labor.

DR. SCHMITZ: The suggestion to strip the membranes came from Iowa, and I would like Dr. Greenhill to explain why they have patients on hand in Iowa.

DR. GREENHILL: A large proportion of the patients in state universities are unmarried girls, and many of them come from distant parts of the state. It costs a lot of money to keep these girls in the hospital for two or three weeks, so labor is induced. I induce labor in my patients who come a long distance or who cannot get to the hospital in a hurry.

DR. SCHMITZ: In cases of toxemia of pregnancy, physicians in Winston-Salem have suggested ripening an unripe cervix. Dr. Fitzgerald, a ripe cervix is one of the important prerequisites to trying to induce labor; how would you define such a cervix?

DR. FITZGERALD: A ripe cervix is one that is almost completely effaced, at least, and has dilated 1 or 2 cm. so that you know there is a well-formed lower uterine segment and a uterus that is ready to go into labor.

DR. SCHMITZ: Do you feel as easy about in-

ducing labor in a case of breech presentation as you do in a case of cephalic presentation?

DR. FITZGERALD: There is more argument about the rationale of inducing labor in the former instance, and I don't know that it really holds water. The patient with a breech that you have been unable to convert externally is going into labor some time, and it seems to me that it makes little difference whether she starts having contractions spontaneously or whether you start the contractions for her if the breech is down in the pelvis so that there isn't the problem of possible prolapse of the cord. Prolapse of the cord is more likely with a breech when it is in the pelvis than if the head is well down in the pelvis, and probably on that basis it would be better not to induce labor. However, I still think it makes little difference whether you start labor or it starts spontaneously. The mechanism is the same, and nothing is going to happen so far as the relative position of the baby is concerned if the patient is all ready to go into labor. I shy away from inducing labor in breech presentations on the basis of the possibility Dr. Greenhill warned about—that if anything goes wrong the physician is likely to be the goat. And it is probably more likely that something will go wrong in a case of breech presentation than in a cephalic one. I duck them; it isn't a particularly intelligent ducking, but I do it.

DR. SCHMITZ: Dr. Greenhill, getting back to the question of induction, if the cervix is ripe, suppose you have waited the six hours and you are using Pitocin and you have stripped and ruptured the membranes and the patient doesn't go into labor. This happens, I grant you, in only about 1 or 2 per cent of inductions, but what do you do?

DR. GREENHILL: I've been lucky; so far I have not had such a case. The assumption is that if you rupture the membranes and give Pitocin for 18 hours and nothing happens, you do a cesarean section. Dr. Fitzgerald said he had no fear of patients going on for days after rupture of the membranes. I think there is a vast difference between spontaneous and induced rupture of the membranes. Fortunately, so far I have not had to resort to cesarean section in any patient in whom I have used intravenous pituitary extract.

DR. SCHMITZ: What about repeating the use of Pitocin after 24 hours to have further effacement and dilatation take place, and repeating it on the third day, if this is necessary, to induce labor?

DR. GREENHILL: I have given it on two successive days.

DR. SCHMITZ: Do you advocate it?

DR. GREENHILL: Yes. It is either that or cesarean section.

DR. SCHMITZ: You would give Pitocin on successive days in preference to performing cesarean section?

DR. GREENHILL: Yes. I had one patient in whom I used it three times, with success.

DR. SCHMITZ: In a patient with placenta previa who has been bleeding considerably but in whom there is no bleeding at the present time, would you hesitate to induce labor if examination revealed a low-lying insertion?

DR. GREENHILL: One must differentiate between low-lying placenta and placenta previa. I would never use pituitary extract in a case of known placenta previa. Even in a patient with a low-lying placenta, I would prefer not to use pituitary extract. The cervix is too friable to take a chance with any pituitary preparation until after the baby is out; I would not use it for induction. Rupture of the membranes is safer.

DR. SCHMITZ: Would you perform cesarean section in all these patients who are not in labor when they have the bleeding episode?

DR. GREENHILL: No. We are now treating more patients with placenta previa conservatively. Generally following the first bleeding episode, which ceases spontaneously in most cases, one can keep the patient in the hospital until the baby is mature. In cases of profuse bleeding, regardless of the degree of placenta previa, I prefer cesarean section, and I certainly prefer it in all cases of total placenta previa.

In cases in which the bleeding stops and the baby seems not to have reached the point of viability, we do nothing except keep the patient in the hospital until repeated bleeding episodes force our hand. We do give trans-

fusions, until the baby is mature, and we salvage some babies we would not have salvaged previously.

DR. SCHMITZ: If the infant was pre-viable you would not do a cesarean section?

DR. GREENHILL: I would wait. If anything forced me to do something, it would be profuse bleeding. Moderate bleeding can be overcome with conservative therapy, but profuse bleeding calls for a cesarean section even when the baby is a monstrosity or is dead; you have to empty the uterus to save the mother's life.

DR. SCHMITZ: Dr. Fitzgerald, do you think of any other indication for induction?

DR. FITZGERALD: There are quite a number of other indications, and I would like to comment on Dr. Greenhill's treatment of placenta previa, which is perfectly sound, but there is another side to the problem. At Cook County Hospital, for instance, we see a number of multiparas who have placenta previa, who are bleeding enough to be worrisome but not necessarily profusely, and who have dead babies or completely nonviable babies. All of you remember that in the old days one of the standard treatments for placenta previa, if it wasn't a total placenta previa, was to rupture the membranes and let the head settle down and stop the bleeding or at least decrease it. We still induce labor in these patients at Cook County Hospital, and we have no record of any damage to the mother as a consequence. We rupture the membranes and then give Pitocin if contractions do not occur. We do not think there is any damage as a result of the procedure. The patient must be watched all the time.

DR. SCHMITZ: Wouldn't you do the same thing in abruptio placentae with a pre-viable or a dead baby?

DR. FITZGERALD: We do the same thing, and we reported a series of cases within the past three or four years, many of which had been treated by induction when separation of the placenta was known to be present. We had no evidence in the series that we lost any babies by inducing labor instead of performing cesarean section. Some of the babies, of course, already were dead; some of them were pre-viable, and there is also a danger in keeping these patients. The pediatricians are hounding us all the time about letting the baby get to term—including cases of toxemia, abruptio placentae, placenta previa, repeat sections, almost anything. But the patients with placenta previa who once start to bleed are certainly dangerous to keep around. They can start bleeding suddenly and disastrously, and I am not sure it is wise to take a chance with the mother to "ripen" a baby unless you think the mother is in such condition that you really are not taking a chance.

Not too long ago we had a patient with placenta previa whom we kept in the hospital. We had blood set up for her, we did all the things one is supposed to do to allow the baby to get bigger. The original bleeding was minimal, but minimal bleeding occurred three times, each time a little more than before. But it wasn't enough to worry about, and we still kept her. Then one morning the blood poured out so rapidly that the patient was dead before we could give a transfusion. Keeping these patients who are bleeding and have warned you that they probably are going to bleed again is like sitting on a volcano. Naturally the baby of the patient I just mentioned did not survive, so we didn't do anyone any good. It is not too safe to keep such a patient, even though you think you have everything ready.

We induce labor in other situations. We induce labor in diabetic patients. We try to "empty" a diabetic before the baby gets to the point where it is likely to die in the uterus. There is no standard time to induce labor, but in diabetic patients we induce labor when the cervix isn't particularly ripe because we want to give the baby a better chance to survive than he would have by staying in the uterus. If there were any standard time to do it, it would probably be 37 weeks. This is open to plenty of argument, but it is pretty well known that the survival rate of babies increases rapidly from 32 to 36 weeks and that from 36 to 40 weeks the salvage is just about the same; a baby at 36 weeks plus has almost the same chance of survival as does a baby much closer to term.

We do not induce labor because of heart disease at Cook County Hospital, but many physicians do. We have found, and all of you know, that when labor is induced the patient may have and is probably likely to have a longer labor than is a patient in whom labor starts spontaneously, and we do not want our cardiac patients to have any more labor than necessary.

We induce labor in many cases of toxemia, we induce labor in polyhydramnios, and we induce labor in patients who come in with ruptured membranes; many of these patients have a fever, and we think the sooner the babies are delivered the better chance they have to survive.

DR. SCHMITZ: Dr. Greenhill, do you agree with Dr. Fitzgerald's comments on induction of labor in diabetic patients?

DR. GREENHILL: No. I prefer cesarean section at about 37 or 38 weeks. Many of these babies are large, and at 37 or 38 weeks some are as heavy as many mature babies. However, in the case of a patient with diabetes I always listen to the advice of the man who is caring for her from the diabetic standpoint. I am only the mechanic. Throughout the world there is more and more tendency to do cesarean section in diabetic pregnant women.

DR. SCHMITZ: In the diabetic, then, although 37 weeks is important, in your opinion, the size of the infant is just as important.

DR. GREENHILL: Yes, and I would like to make one other point concerning these cases. The babies that are delivered at 36 and 37 weeks must be treated as premature infants regardless of how much they weigh.

DR. FITZGERALD: Another group of patients who have had a great deal of publicity in regard to induction of labor are Rh-negative mothers who have had bad results with previous pregnancies. It has been suggested that the baby should be delivered early on the theory that the chance of survival might be better. We have not had any success with this procedure, but in many areas labor is induced in these patients before term.

DR. SCHMITZ: Here, again, don't you think the tendency is toward performing cesarean section? The pediatrician wants to do a replacement transfusion and would like to have the baby before the thirty-seventh week, and prematurity and the trauma associated with induced labor are not a good combination.

DR. GREENHILL: A cesarean section doesn't improve that situation. I oppose induction of labor ahead of time. There are obstetricians who terminate pregnancy prematurely in all Rh-negative women who have antibodies in the blood during pregnancy, but the great majority of obstetricians prefer to leave the babies alone and treat them with complete transfusions when they are born. This is far safer than to have the babies born prematurely, because then one has the prematurity problem as well as the problem of toxicity.

DR. SCHMITZ: Don't you think the real damage occurs about the thirty-seventh or thirty-eighth week—the massive edema, intrauterine death, and so on?

DR. GREENHILL: Massive edema is rare. Most of the babies have jaundice or anemia or both, and the majority of them can be salvaged as normal babies by complete transfusion immediately.

DR. SCHMITZ: You believe that complete transfusion immediately is the answer, rather than terminating pregnancy at an early date?

DR. GREENHILL: Yes.

DR. SCHMITZ: Dr. Fitzgerald, do you agree?

DR. FITZGERALD: I think so. We do not try to deliver the babies early in these cases. Our experience has been that if fatal damage to the baby has occurred it has done so long before, and inducing labor three weeks early will not save him.

DR. SCHMITZ: There is one more phase of this subject I would like to discuss before we turn to the "induction of convenience," and that is the desultory or prolonged labor. Ten years ago the incidence of prolonged labor was about 4 to 5 per cent. Today it is reported as 1.5 to 2 per cent. Much of this improvement has resulted from stimulation of labor in these patients. Now, let us suppose a primigravida has been in labor for 24 hours and has made very little progress. What is your customary treatment of that patient, Dr. Greenhill?

DR. GREENHILL: I do not wait 24 hours

before making up my mind what to do. If a patient starts in active labor (and that is not always easy to determine) and if labor continues for 18 hours, I sit down and take stock; in other words, I make a complete evaluation of the patient, just as if I had been called in consultation to examine her. I make a decision whether to let the patient continue in labor or to do a cesarean section. I do not by any means imply that at the end of 18 hours of labor one should empty the uterus from above or below, but one should take stock. If the decision favors a cesarean section, that is simple. If not, then the patient should have a long period of rest, which can be produced by DEMEROL®, morphine or some other drug. The patient should have three or more hours of complete rest.

What usually happens in these cases, in my experience, is that the labor progresses while the patient sleeps. Then the patient continues in labor for several more hours and the baby is delivered from below without any trouble. The important thing is to make sure there is no reason for doing a cesarean section. Here we have one of the indications for Pitocin stimulation. In some of the patients who have weak, nagging pains for 18 hours I think the use of an intravenous pituitary preparation is most helpful.

DR. FITZGERALD: I am sure it is very useful. There may be some danger connected with the use of PITUITRIN®, but any drug can be dangerous if the man using it is dangerous. Even water can be dangerous. Patients have been drowned in intravenous water. Water is harmless if properly used, and Pituitrin is pretty close to harmless. It seems to me that in any obstetric case one should find out what the patient is not doing that she should be doing; and if what she is not doing is having reasonable uterine contractions at reasonable intervals, you treat that. The way to treat it is to use something that will give her uterine contractions of reasonable force and at reasonable intervals so that one can determine whether labor is going to progress normally. Inadequate contractions for a long period can wear out the patient, and many of them can be helped by sedation and letting them start over again. But I see no reason to wait any great length of time if the patient's contractions are quite evidently inadequate. We use Pituitrin in patients whose contractions are inadequate, and I have never seen any bad results from it.

DR. SCHMITZ: In primary uterine inertia or desultory labor, why do you specify 18 hours, Dr. Greenhill? Others say 24 and even 30 hours.

DR. GREENHILL: I didn't use the 18 hour figure for desultory pain. I use 18 hours as an interval of time for me personally to stop and re-evaluate the patient. Most patients deliver long before 18 hours have elapsed. We know that as the years go on labor is shortened even spontaneously, aside from the almost routine use of low forceps. Like Dr. Fitzgerald, if I see that there is something wrong even after only two or three hours, I do something to correct the condition. We do not have a time limit. One hour of a so-called test of labor may be enough to force a decision, and sometimes 15 hours do not suffice.

DR. SCHMITZ: The only way to judge the efficiency of the pains is by what they create in work.

DR. GREENHILL: Right.

DR. SCHMITZ: And by evidence of effacement and dilatation.

DR. GREENHILL: Yes.

DR. SCHMITZ: But a woman in the first few hours of labor may have done very little with the cervix that was thick when she started, and you would have a hard time determining that in a few hours.

DR. GREENHILL: I am willing to wait. I am not concerned as long as the patient is not in great distress and I can assure her that her labor is going along all right, which is very important. We must treat the mental aspect by reassurance; the same applies to the husband. So the time element alone is not the important thing. At the end of 18 hours of labor, if I feel that the patient can go on and deliver, I will let her continue for 10 to 12 hours more.

DR. SCHMITZ: Suppose this woman has rested, and so forth, and has been stimulated with an oxytocic, and her situation doesn't improve.

DR. GREENHILL: Then I would do a cesarean section.

DR. SCHMITZ: Do you agree with that, Dr. Fitzgerald?

DR. FITZGERALD: I think so. That is a dysfunctional labor, whatever that means.

DR. SCHMITZ: You have to have a Murphy tokograph to tell that, don't you?

DR. FITZGERALD: Well, as all of us who take care of these patients know, or should know, there is a difference between contractions and pains. Many patients have painful labor and the contractions just are not worth anything and the patients make no progress. If stimulation fails to produce the result you expect, there is no sense in letting the patient continue in labor for 48 hours. She is much better treated by cesarean section when you know she will not have a normal time of labor.

Induction of Labor for Convenience

DR. SCHMITZ: Now we come to what I consider the most important facet of our assignment, the induction of labor for convenience. We all know that the entire trend in cities is changing. People are moving to the suburbs, and hospitals are being built in suburban and outlying districts. The hospitals surrounding the city of Chicago care for 4000 obstetric patients a year or more, and in the heart of Chicago about 1400 mothers are registered per year. Why should a woman come to the center of the city, a distance of 25 or 30 mi., when she can go to a hospital and an obstetrician near her home? However, some mothers are loyal to an institution and to their accoucheur and will come any distance. They are patients for whom "induction of convenience" seems to be acceptable. The physician says that the distance is too far and the patient is a multipara and therefore she would rather come in and have labor induced; or the obstetrician says, "She has had difficulty, and to do away with the hurry and bustle and inconvenience, and so on, she can come to the hospital at her leisure and when I can be there, at a time when it is convenient for me, and therefore I am going to have her come in and I am going to induce labor." What do you think of that kind of reasoning, Dr. Greenhill?

DR. GREENHILL: I fully agree that labor should be induced in patients who live too far from the hospital to come in comfortably or whose husbands travel and who must make arrangements for the care of children before going to the hospital. I haven't any objections to that sort of convenience. But there are other situations which unfortunately are widespread in this country. Some doctors whose patients live in large cities are inducing labor in from 20 to 40 per cent. That, I think, is meddlesome obstetrics, and not because there is any real danger to the baby or the mother. Today induction of labor is safe if a doctor uses proper and sober judgment and proper technic. But some doctors are not quite honest, such as the physicians who rupture the membranes in their offices and then say there was an accident and send the patients to the hospital.

The incidence of complications when labor is induced, such as prolapse of the cord and fetal death, is very low when the cervix is ripe and the head is engaged. With breech presentation, cord prolapse may occur a little more often.

I am worried about what is going to happen to the practice of obstetrics as far as lawsuits are concerned. I return to that subject because I happen to know more than is in the literature. I caution you to carry enough malpractice insurance, because the awards are climbing higher and higher.

The incidence of induction of labor for convenience should be low.

DR. SCHMITZ: Dr. Fitzgerald, do you agree?

DR. FITZGERALD: The percentage should be small, and I think in most well-run institutions it is reasonably small. Where the percentage of inductions which are done for the doctor's convenience is high, the patient doesn't have much to do with it. But in the case of a multipara who is two weeks from term and whose cervix is dilated 4 cm. and who has a history of rapid labor in previous pregnancies, even aside from the inconvenience of arranging for care of two or three other children at 3 o'clock in the morning, I think it is really better to induce labor. Such a patient can deliver so rapidly that she will have the baby

before she can get anywhere, and the baby is in jeopardy because there is no one to take care of it. If the cervix is that ripe, the patient is bound to begin labor if you induce it with any means at all, and she is much safer in a hospital. And such a patient need not live 25 mi. from the hospital. Transportation in cities isn't rapid. She may live only a few miles away and be an hour away from the hospital, during which time things can happen. I consider such a situation an indication for induction of labor, but, as Dr. Greenhill said, if anything goes wrong you are likely to be the goat.

DR. SCHMITZ: If you induce labor, are you conscience-bound to stay with that patient until she delivers?

DR. FITZGERALD: We never induce labor without staying with the patient. We are there until she delivers.

DR. SCHMITZ: Isn't that one of the dangers, that the physician will not stay with the patient?

DR. FITZGERALD: I think it is. If labor is induced and the patient is left alone in the hospital, she is not much better off than she would be at home, unless it is a very well-staffed hospital.

DR. SCHMITZ: What are some of the prerequisites to induction of labor, especially induction of convenience, Dr. Greenhill?

DR. GREENHILL: The baby should be large enough. Many times, as you know, cesarean section is done electively and the baby is too premature to survive, yet the doctor who performed the cesarean section thought the baby was large enough; so one may be mistaken.

The cervix must be partially effaced and certainly partially dilated. I would limit induction of labor to head presentations as far as the average doctor is concerned, and with the head engaged.

I caution against the use of any pituitary preparation in a woman who has had four or more babies. Most ruptures of the uterus occur in women who have had many children, the so-called grand multiparas who should have easy labors.

DR. SCHMITZ: Dr. Fitzgerald, can you think of anything else?

DR. FITZGERALD: No. The cervix must be definitely ripe so that you know the patient is going into labor. Sometimes it is necessary to induce labor even though you know the baby is not large. All of you have seen multiparas in whom the cervix is greatly dilated and who, when the membranes rupture and they have a few pains, will have their babies and nobody can stop them, even though the babies are not large. A cervix as dilated as that isn't going to stay that way for long. The size of the baby is a good theoretical consideration, and I don't think any physician induces labor when he knows the baby is big enough except when he knows labor is bound to start regardless of the baby's size.

The important thing is that the cervix is ripe enough, and then it is simpler for the patient to make arrangements and be delivered two days before she might do so spontaneously.

DR. SCHMITZ: A physician in the audience has asked us to comment on the use of induction of labor for so-called postmaturity. Dr. Fitzgerald, do you see much postmaturity at Cook County Hospital?

DR. FITZGERALD: We see some, but not as many cases as are seen in private practice. Induction is a perfectly justifiable procedure in these patients. If there is reasonable evidence the patient is too long past term, the baby probably has a better chance in the nursery than it has in the uterus.

DR. GREENHILL: I have seen very few cases which I would be willing to label postmature. I suppose one reason the question was raised is that a great many British physicians are inducing labor for what they call postmaturity. I say that postmaturity, while it does occur, is unusual.

DR. SCHMITZ: Do you think that with the aging or the aged placenta there is interference with oxygenation?

DR. GREENHILL: That is the theory, and some obstetricians claim they can tell this clinically. Of course when meconium escapes from the uterus during labor and the heart tones are irregular, we know something is wrong clinically. There is no proof, however, of an aged placenta clinically. Even when the

placenta is out, there is difficulty in diagnosing senility. We still have to find a way of determining senility of the placenta while it is still in utero.

DR. SCHMITZ: Dr. Fitzgerald, here is a question directed to you. Would you use Pitocin in the second stage of labor? If so, when? Should this preparation be administered only intranasally or are other methods of administration permissible?

DR. FITZGERALD: We use Pitocin in the second stage of labor if uterine inertia develops. Several years ago in this city, the night before a meeting of the Gynecological Society, Dr. Falls of the University of Illinois had a patient whose cervix was completely dilated, with the head showing, and whose labor pains stopped completely. He told the residents to sit with the patient and watch the heart tones all night. If they remained normal, nothing was to be done, and he would deliver the baby at the meeting the next morning, which he did. There is no reason that patient should not have had a little stimulation, because that was all she needed. The pains stopped, and they do that sometimes, and I think in the second stage sometimes they slow down.

We do not use intranasal Pituitrin, but it is perfectly all right. We set up a bottle with a very minimal amount of Pituitrin or Pitocin or SYNTOCINON® and just let the patient have enough to stir up a few contractions. I think this is preferable to using a forceps, which usually requires an anesthetic.

Postgraduate Clinical NOTES

148. SENESCENCE AND DISEASE

In psychiatry, as in medicine, there has been a growing appreciation during the past few decades that much that formerly passed for the effects of innate decline in senescence is the consequence of specific and often reversible disease. Many old people when afflicted with mental illness become apathetic, inert, retarded, gloomy—and their personal standards may decline so as to suggest advancing senile decay. Extreme agitation or muteness may augment the outward appearance of decrepitude. Yet many patients, presenting thus, suffer, in fact, from a depressive illness which treatment will mitigate or cure. Old people with paranoid psychoses causing excited behaviour, hallucinations, hostility, and vituperative speech may again be improved nowadays by treatment and at times rehabilitated into the community. There is also much to suggest that the alleged immunity of the aged from neurotic breakdown is partly illusory, and that neuroses starting *de novo* in late life and often mitigated by simple measures are not as rare as hitherto supposed. Fulminating delirious states may render the patient inaccessible, and he may appear in hospital in a moribund state. A relatively short history of illness should lead one to suspect that here, too, the impression of advancing senile degeneration is likely to be erroneous. Underlying such delirious or "confusional" states there is, in a high proportion of instances, a specific physical disease which may be susceptible to treatment.

M. Roth, Problems of an ageing population, *British Medical Journal*, April 23, 1960, pp. 1226-1230

SCIENTIFIC EXHIBIT

Congenital Muscular Torticollis (Wryneck)

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This exhibit was presented initially at the 1959 meeting of the American Medical Association in Atlantic City, New Jersey.

Congenital Muscular Torticollis

Definition

Congenital muscular torticollis is a condition characterized by the formation of a tumor in the sternocleidomastoid muscle soon after birth. It should not be confused with congenital bony anomalies of the neck, such as the Klippel-Feil syndrome, or with spasmodic torticollis in older patients.

Study of 35 Infants With Tumors of Sternocleidomastoid Muscle

From January 1, 1944, through December 31, 1954, a total of 35 infants with sternocleidomastoid tumors and torticollis were observed and followed at the Mayo Clinic.

Thirty were managed conservatively, with excellent results. Five were treated surgically and two of these five had poor results. Four of those treated surgically were among the 15 infants seen in the period from 1944 to 1947; the fifth was among the 20 infants seen in the period from 1948 to 1954. This reflects the trend toward conservative management since 1947.

Sex		Presentation		Side involved	
Female	19	Breech	14	Right	16
Male	16	Vertex	21	Left	18
	35		35	Right and left	1
					35

How Often Is the Tumor Discovered?

A tumor was discovered in 35 of 7,835 resident-born infants examined and followed by us, giving an incidence of 0.4 per cent.

Who First Discovered the Tumor?

The tumor was first discovered by the physician in about half of these 35 patients and by the mother in the other half. This suggests that these tumors frequently are unnoticed by the parents and, therefore, a history of tumor may not be obtainable for older children in whom the classic wryneck deformity later develops.

Pathology of the Tumor

The tumor is actually a fibrous replacement of muscle and is not a neoplasm per se. Although it always disappears within a year, it leaves varying amounts of scarring within the muscle.

Cause Is Not Known

Congenital torticollis apparently is not caused by injury during birth; however, it does occur frequently in breech presentations. (In 40 per cent of our cases breech presentations had occurred.)

Cases have been reported after cesarean section. No evidence of hemorrhage in the sternocleidomastoid muscle has been found.

Some Patients Do Not Improve Spontaneously

It is not known why a few patients do not fully recover spontaneously, as explained elsewhere in this exhibit, but have a permanent wryneck deformity.

The extent of involvement of the muscle by the tumor may be a factor.

Natural Course of the Disease

During First Month

Tumor usually is discovered.

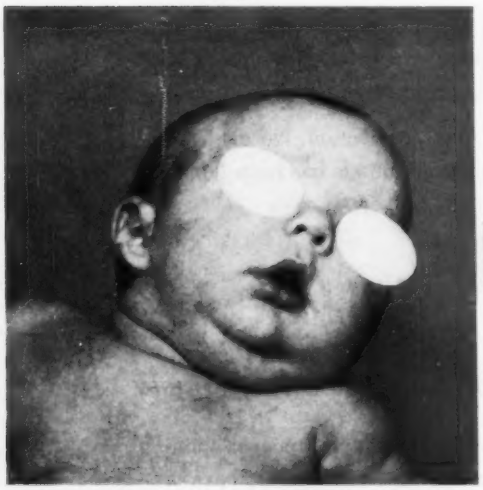
Most Patients Recover Spontaneously

The first sign of congenital muscular torticollis is a tumor of the sternocleidomastoid muscle that appears during the first month of life.

The tumor gradually disappears when the child is between two and five months of age, but noticeable asymmetry of the face, head and neck develops simultaneously during that period.

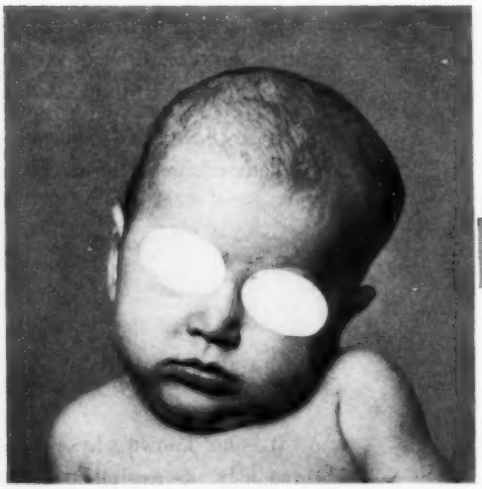
By one year of age most patients have lost the asymmetry; the tumor has disappeared, and no residual torticollis remains.

In an occasional patient, contracture of the sternocleidomastoid muscle occurs, and torticollis, or wryneck, is the result.



During Second and Third Months

Tumor reaches maximal size and asymmetry becomes noticeable.



During Fourth and Fifth Months

Tumor begins to disappear and asymmetry becomes maximal.

In Most Patients at 9 to 12 Months or Older

Asymmetry and tumor completely disappear, with no residual torticollis.

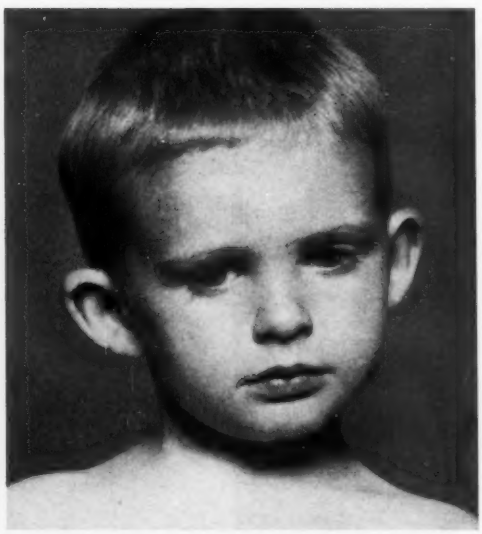
In a Few Patients at 9 to 12 Months or Older

Tumor disappears; muscle becomes fibrosed and contracted, and fixed torticollis results.

Some Pertinent Observations

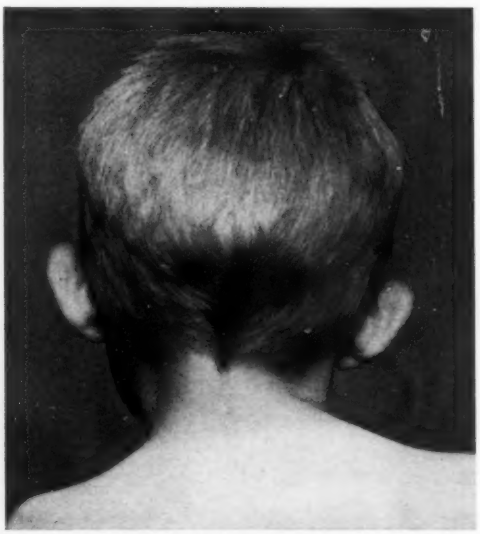
Tilting of Head

Tilting of the head during the course of the disease varies considerably. This girl exhibits pronounced tilting of the head.



Prominent Ear

A prominent ear on the affected side frequently accompanies the facial asymmetry.



Elevation of Shoulder

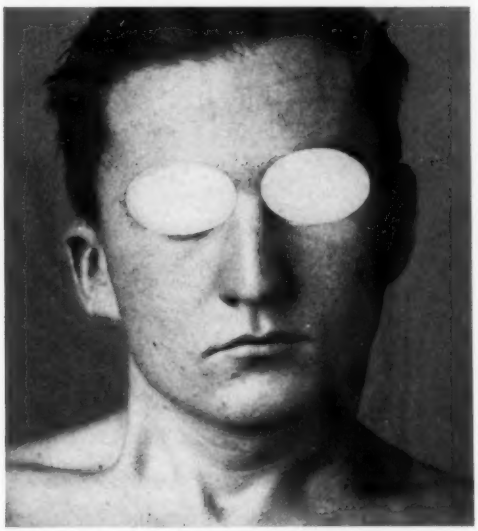
The elevation of the shoulder and the prominent ear are well demonstrated in this back view of the patient shown to the left.

Facial Asymmetry

Some asymmetry of the face is always present in patients with congenital torticollis. The facial asymmetry is moderately noticeable in this girl.

Contracture of Sternocleidomastoid Muscle

The shoulder is elevated as a result of contracture of the sternocleidomastoid muscle on the affected side.



Condition in an Adult

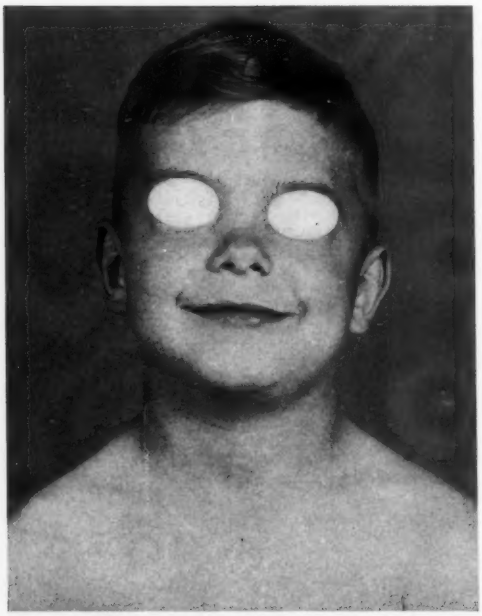
Torticollis deformity in an adult. Note tight clavicular head of sternocleidomastoid muscle, with some tilting of the head.

Treatment of Congenital Muscular Torticollis

Early Treatment Should Be Conservative

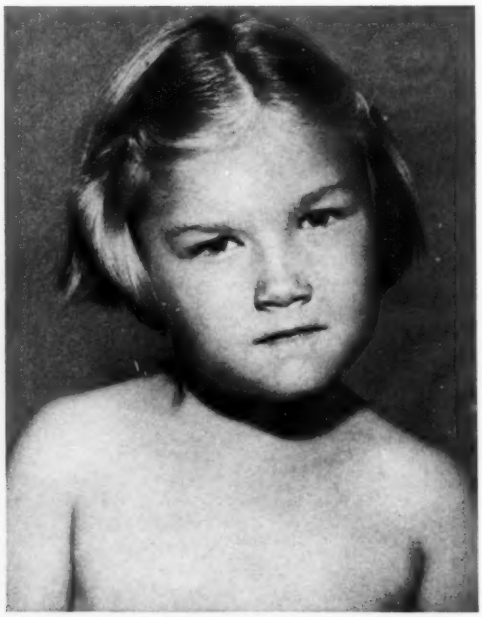
Because the tumor of the sternocleidomastoid muscle disappears spontaneously, and because contracture of the muscle with torticollis deformity develops only occasionally, we believe that treatment of patients less than one year of age should be nonsurgical. We have no evidence that stretching, heat or massage has any value in treatment.

Correction of residual deformity by section of the contracted sternocleidomastoid muscle (see below and page 391) is indicated for those occasional patients who continue to have torticollis deformity after one year of age.



Treatment Not Needed

This boy had a tumor of the sternocleidomastoid muscle that disappeared spontaneously without treatment. Torticollis deformity did not result.



Operation Indicated

This girl had a tumor of the sternocleidomastoid muscle with resultant contracture, causing fixed torticollis.

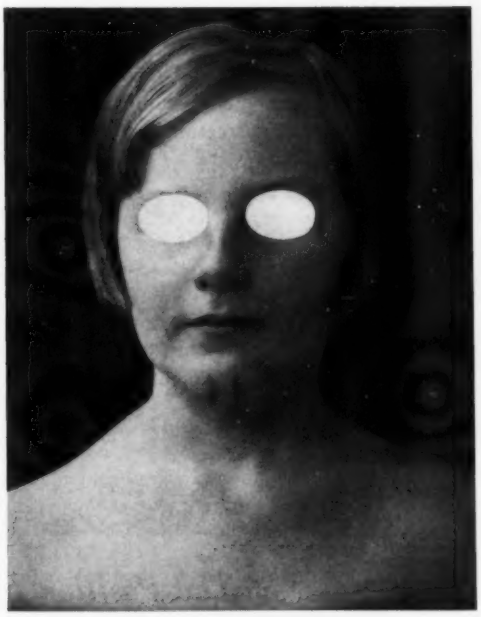
At What Age Should Operation Be Done?

Operation can be performed at any time after one year of age, usually with complete correction of the torticollis deformity. However, if operation is delayed until 12 to 14 years of age, complete correction of the facial asymmetry may not be possible.

Factors causing recurrent deformity:

1. Incomplete correction of the contracted structures.
2. Inadequate postoperative immobilization in the position of overcorrection.
3. The tendency to resume the tilted position of the head because of habit.
4. Temporary interference with binocular vision after correction of the torticollis position because of adaptation of the eyes to the tilted position of the head.

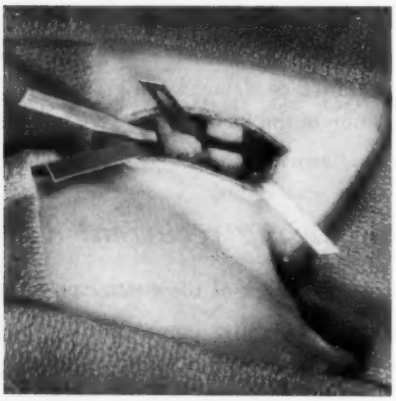
Before Tenotomy



After Tenotomy

Continued on next page

Technic of Tenotomy



Surgical release is accomplished by tenotomy of the sternal and clavicular heads of the contracted sternocleidomastoid muscle under direct vision. Tenotomy of the mastoid attachment occasionally may be necessary. If present, contractures of the platysma, scalene muscles and cervical fascia may have to be corrected at the same time.

A Postoperative Cast Is Important

To prevent recurrence of the deformity following tenotomy a plaster cast should be used to hold the head in a position of overcorrection for six weeks.

The Position of Overcorrection:

1. Head tilted laterally to the side opposite the contracted muscle.
2. Chin rotated to the same side as the contracted muscle.
3. Chin down.

SYMPOSIUM

Massive Intestinal Hemorrhage

ALTON OCHSNER,[1] H. MARVIN POLLARD[2]
AND ANTON M. PANTONE[3]

Often, prompt evaluation of various factors, will enable the physician to decide quite readily whether a patient with massive intestinal hemorrhage is likely to have malignancy, hepatic cirrhosis or a benign process. Determination of blood volume is an important diagnostic procedure and should be done whenever possible; in lieu of this test, serial hematocrit determinations are of value.

Roentgenographic examination usually can be made if the patient is not in shock. The need for careful handling, with a minimum of manipulation, is stressed.

Management of gastrointestinal hemorrhage should be a joint effort. Operation should not be performed in the face of hemorrhage if it can possibly be avoided, but sometimes surgical intervention is necessary. Management of patients with hepatic cirrhosis, particularly, should be ultraconservative, but continued bleeding from esophageal varices may necessitate definitive operative treatment.

DR. ALTON OCHSNER (Moderator): I know of no problem which offers more difficulty as far as diagnosis and treatment are concerned than massive intestinal hemorrhage. It is extremely difficult and even impossible at times to find the cause of the hemorrhage.

ALTON OCHSNER

Dr. Pollard will begin this presentation by considering the various causes of massive intestinal hemorrhage and the measures that he as an internist might undertake to determine the source of bleeding. Dr. Pantone, our radiologic expert, will tell us how he can help in diagnosis. Then we three will discuss treatment.

Causes of Intestinal Hemorrhage

DR. H. MARVIN POLLARD: The first important point to keep in mind in a case of hemorrhage from the upper gastrointestinal tract is that many times the blood loss is not nearly as great as one is led to believe from the symptoms or the amount of vomitus. There may be a massive tarry stool, but that does

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Presented before the forty-fourth annual Assembly of the Interstate Postgraduate Medical Association at Chicago.

H. MARVIN POLLARD

ANTON M. PANTONE

not necessarily mean a large amount of blood loss. Therefore, the first thing to do is to try to evaluate the whole situation, and to do this one must have a little peace and quiet. This may mean quieting down the patient's family, who are naturally apprehensive if they have seen the patient collapse and have observed the vomitus and the black, tarry stool that was passed involuntarily.

Many times, one can decide rather promptly the likelihood of malignancy, a benign process or cirrhosis of the liver. Settling these three questions in your own mind goes a long way in determining the cause of the hemorrhage. Evaluating the patient's age and habitus and obtaining a fairly clear idea of the kind of life he has been living will enable you to make this decision quite readily.

What is the most common cause of upper gastrointestinal hemorrhage? Duodenal ulcer still accounts for 60 to 70 per cent of such hemorrhages. Probably gastric ulcer is in second place. A number of drugs have been incriminated as producers of ulceration and bleeding. I am not convinced that the role of some of these drugs as very potent sources of upper gastrointestinal hemorrhage has been thoroughly established. For example, steroids are blamed for a lot of upper gastrointestinal hemorrhage, and yet there are many figures which indicate that perhaps they are not as dangerous in this respect as has been suggested. If steroid therapy is clearly indicated, I believe one should go ahead and give steroids and not be influenced too much by this one factor. It is true that the incidence of upper gastrointestinal hemorrhage—and, for that matter, the incidence of duodenal ulcer—is a little higher in some conditions than it is in others when steroids are employed. For example, the incidence of duodenal ulcer among patients with chronic ulcerative colitis and patients with bronchial asthma apparently is much lower than it is among patients with rheumatoid arthritis.

Aspirin has been charged as a possible producer of upper gastrointestinal hemorrhage, and again I am not convinced that at the present time this role has been well established. There are various other drugs which I am sure occasionally are sources of upper gastrointestinal hemorrhage. Many of the new drugs used for rheumatic diseases sometimes produce hemorrhage.

Remember also that it is not necessary for an isolated ulcerating lesion to be present as the source of upper gastrointestinal hemorrhage. There may be diffuse oozing of blood from the entire gastric mucosa.

Gastric carcinoma is not an infrequent potential source of hemorrhage, and here again it is up to the attending physician to evaluate the patient, his age, and so on, to get some idea whether malignancy is or is not playing a role. Another fairly common source of upper gastrointestinal hemorrhage is cirrhosis of the liver with esophageal varices. This situation represents a difficult diagnostic problem which we will discuss in more detail later on, but many times one can get a good idea about the presence or absence of cirrhosis just by looking at the patient. Hiatus hernia, I still maintain, is not an uncommon cause of upper gastrointestinal hemorrhage. Finally, there are miscellaneous gastrointestinal lesions which are far too common to mention and too uncommon as sources of bleeding. Keeping in mind the statistical incidence, the major causes will be ulcer, carcinoma and esophageal varices. Of course, the big problem in regard to the latter is whether or not there is also a duodenal ulcer; the coexistence of a duodenal ulcer and esophageal varices makes for a very confusing situation.

How to Establish the Diagnosis

As I have already mentioned, a good look at the patient will tell you a lot about him.

If he is ashen, perspiring, confused and disoriented, he has lost a lot of blood; he is in trouble. Then you take his pulse and blood pressure and determine the hemoglobin level and hematocrit. Those findings alone will give a lot of information. Beyond these things, what can one do? Where you are concerned about differential diagnosis you can get into some of the more delicate procedures. A BROMSULPHALEIN® test of liver function will be of some help in distinguishing duodenal ulcer from cirrhosis of the liver and esophageal varices. It is a good test, but it can let you down. In one of my patients, a woman who is a chronic alcoholic and who has cirrhosis of the liver, it yielded perfectly normal findings. Bromsulphalein retention and blood ammonia and uropepsin levels are three determinations that can be done when a patient is quite ill from an upper gastrointestinal hemorrhage. They will not necessarily establish the diagnosis—for instance, if the patient has both a duodenal ulcer and esophageal varices, the uropepsin may be high and the patient may be bleeding from the varices and not from the duodenal ulcer. So the picture may be confusing, but these laboratory studies are of some value.

Finally we come to endoscopy. I have a number of good friends who do a lot of esophagoscopic and gastroscopic examinations in cases of massive upper gastrointestinal hemorrhage. I have attempted endoscopic examination on a few occasions, and more than once I have refused to do it. It seems to me that it is somewhat hazardous and perhaps not quite worthwhile in a patient who is bleeding massively from the upper gastrointestinal tract. I have not learned very much from endoscopic procedures in these cases. Some of my friends are quite enthusiastic about endoscopy and employ it in the first 24 or 48 hours, but I have not been enthusiastic about it as a diagnostic procedure.

We use the string test sometimes. As you know, it is a very old test. It still has some value, especially when the bleeding is more chronic than acute. One can put the string down and leave it in place for several hours, and then by doing the benzidine test one may be able to determine the level of the bleeding. Simply putting down a Levin tube or a small polyethylene tube into the stomach and aspirating blood will give some idea about the site of the bleeding—at least whether it is in the upper digestive tract.

In addition to these diagnostic procedures, there is, of course, radiology, and we will hear about that in detail a little bit later.

Before I turn over this discussion to the other panel members, I want to mention one extremely important point, which is that one should determine as closely as one can how much blood the patient has lost. You can learn something about this by the hemoglobin determination. That is your No. 1 laboratory test. If the level is 7 gm. or less, certainly the patient should be treated for serious shock. If his blood pressure is 100 or less, he is in trouble; if the pulse rate is 100 or above, he is in trouble.

It is also very helpful to know the blood volume, because at this critical stage one needs to know how much blood needs to be replaced. Therefore, the blood volume determination is an important diagnostic procedure. Many laboratories are not equipped to employ radioisotope studies, but more and more such facilities are being made available. The utilization of radioactive human serum albumin to determine the blood volume makes it possible to complete the procedure in about 30 minutes, and along with the hematocrit this will give a good index of the patient's blood volume. Then one can decide whether whole blood or packed red cells should be given, or no blood at all.

DR. OCHSNER: Thank you for that excellent presentation. It is refreshing to hear an eminent gastroenterologist like Dr. Pollard say that he thinks that probably endoscopy is not the final answer. I am glad you emphasized the importance of blood volume determination. In the institutions which are not equipped to do blood volume determinations, serial determinations of hematocrit are of value.

Before Dr. Pantone presents the radiologist's role in diagnosis of intestinal hemorrhage, I wonder if Dr. Pollard would tell us what he thinks is the value of splenic pressures

obtained percutaneously in a patient who might have cirrhosis.

DR. POLLARD: Splenic pressures, I think, are of value. One of the important aspects of this technic—for example, when you suspect that a patient has portal hypertension—is to be sure to determine the prothrombin time. A patient with portal hypertension has liver disease, and he probably is going to have a prolonged prothrombin time, which means he has a reduced percentage of prothrombin and a bleeding tendency. You do not want to put a needle into the spleen if the prothrombin time is much under 60 per cent. Splenic pressure is a good index of portal hypertension if you can get a satisfactory reading, but ordinarily we are not set up to use this procedure and hence I find it is not being done very commonly. Technically speaking, it is of value.

The Role of the Radiologist

DR. OCHSNER: Now, Dr. Pantone will discuss the role of the radiologist in helping to determine the site of massive intestinal hemorrhage. The radiologist, we know, is an extremely important member of any team, and particularly in gastrointestinal lesions. Some physicians feel that in the presence of massive hemorrhage, roentgenographic examination is not justified because of a possible hazard, and I hope Dr. Pantone will discuss that as well as the methods he will use and how he will be able to tell us where the hemorrhage is coming from.

DR. ANTON M. PANTONE: First I would like to ask Dr. Pollard one question. Can you define for us just exactly what comprises massive intestinal hemorrhage, using as a basis the patient's hemoglobin determination, or how much blood he may need for replacement therapy? Is there a rule of thumb that is used? Many patients who lose some blood but not a great amount still present a picture of shock, perhaps from fright more than anything else, and yet they may have adequate blood circulating in the blood stream.

DR. POLLARD: I do not think one can give a rule of thumb in this situation, for the simple reason that it is extremely important to evaluate very carefully the amount of bleeding that has occurred. I mentioned a hemoglobin level of 7 gm., and the hematocrit might be given as 20 or 25 per cent. As Dr. Ochsner said, serial hematocrit determinations are quite important because one is faced with this business of hemoconcentration. How rapidly does the blood return its own blood volume? That varies from person to person. One cannot necessarily wait 24 hours and believe that at the end of that time the hematocrit is back to its original status. A hemoglobin level of 7 gm., the hematocrit determinations, the blood pressure and the pulse rate give a lot of information that is helpful. Blood volume determinations should be done whenever it is possible.

DR. PANTONE: We are usually able to examine practically all patients with massive intestinal hemorrhage roentgenographically, except those who may be in shock. Naturally it would be hazardous to bring a patient to the x-ray department in a state of shock. On the other hand, many patients who have had a great deal of bleeding from the gastrointestinal tract can be examined without any danger.

The examination was probably first popularized in the late 1930s by Dr. A. O. Hampton, who described a "hands-off technic" for examination of the upper gastrointestinal tract; that is, the patient was brought to the x-ray department, given barium, and moved in various positions so as to take advantage of the air and barium outlining the anatomy. The Hampton technic has been used by most radiologists. Today it is a popular technic. However, today we resort to minimal palpation, not originally suggested in the description by Hampton. With a patient who may be bleeding severely, one does not palpate, lest bleeding start again.

Figure 1 portrays very nicely a case of esophageal varices. In this patient there is no doubt about the diagnosis. One can see the large filling defects throughout most of the esophagus, and the filling defects were present at all times. These were huge esophageal varices and the cause of the patient's bleeding. Our findings in patients whom we examine for possible esophageal varices are not always

FIGURE 1. Esophageal varices.

FIGURE 2. Large gastric ulcer in midportion of lesser curvature of stomach. Note the sunburst appearance resulting from cicatricial contraction.

as depicted in figure 1. Usually, patients sent to us because of possible bleeding from such lesions have a Bromsulphalein retention higher than 15 per cent. They have other stigmata of hepatic cirrhosis; we merely prove the diagnosis of esophageal varices. We probably see about 50 per cent of the esophageal varices which are present. In other words, we anticipate missing 50 per cent. We try various technics, using thin barium and thick barium. We utilize the so-called Mueller maneuver in trying to increase the venous pressure within the vessels of the esophagus so that they distend and exhibit the characteristic picture. We take multiple films of the esophagus, and this might increase our percentage of positive diagnoses. However, the diagnosis of esophageal varices is a very difficult and trying one at times, even though the lesions are present.

The patient whose film is shown in figure 2 has a large gastric ulcer. The diagnosis is not difficult. The ulcer arises from the midportion of the lesser curvature, and it probably is a large benign ulcer. I say this because, as you will note, there is a tendency toward puckering of the mucosa in the direction of the ulcer; there are radiating lines extending from the large ulcer inferiorly and laterally and superiorly, giving a sunburst appearance. This is the cicatricial contraction which occurs with healing of the ulcer, although the ulcer is quite large. In my experience, practically all ulcers of this magnitude, or even larger, are frequently benign, especially when they have the so-called sunburst appearance depicted so clearly in this case.

Hiatus hernia is not an uncommon finding in examinations of the upper gastrointestinal tract. These hernias vary in size and in type. When I first started doing upper gastrointestinal examinations it was of interest to me that every physician who referred a patient would always be sure that he had instructed me as to how to find the hiatus hernia. He wanted me to stand the patient on his head and to be sure the patient bore down while he was standing on his head, and to be sure that I jumped up and down on his belly a couple of times. Actually, if the patient did not have a hiatus

FIGURE 3. Demonstration of small ulcer crater in duodenal cap in a case of upper gastrointestinal bleeding.

FIGURE 4. Deformity of duodenal cap in case of massive intestinal hemorrhage proved to be an aneurysmal dilatation of the hepatic artery resulting from the placement of a suture too close to the artery at the time of cholecystectomy.

hernia, in most of these instances one probably would be produced.

Patients who have hiatus hernia and are bothered by it will manifest the hernia with very little difficulty on the part of the examiner. In my experience, hiatus hernia which causes symptoms and bleeding is always apparent. One can diagnose hiatus hernia with the chest film in many instances.

More important, perhaps, than hiatus hernia, which may or may not be present, is the presence or absence of regurgitation of barium from the stomach into the esophagus. This gives a clue. It tells you that the gastric juice is regurgitating into the esophagus and creating a situation that is not very healthful and may be the cause of the patient's death; that is, it may cause esophagitis. The esophagitis may be severe or it may be mild. Sometimes when it is severe it may be accompanied by large ulcers which may be a cause of bleeding.

In the film in figure 3, you will note that there is a small ulcer crater in the duodenal cap. The only positive evidence for diagnosis of an active ulcer is the presence of an ulcer niche. Naturally the pathologist can tell you that it is there, or the surgeon can tell you when he sees it. We have many indirect signs for the presence of peptic ulcer of the duodenal cap. These are deformities due to a combination of factors. Edema with marked coarsening of folds will contribute to the deformity. A deformity due to fibrosis occurs in a long-standing ulcer. In the case depicted in figure 3, the patient was referred for examination of the upper gastrointestinal tract because of bleeding. The patient was relatively young, and we noted the ulcer crater, which is prima-facie evidence of ulceration and presumably was the site of bleeding.

Sometimes when patients with obvious gastrointestinal bleeding are sent to us for examination, we examine and re-examine and I am sorry to say we do not come up with a diagnosis. This does not mean that if a patient

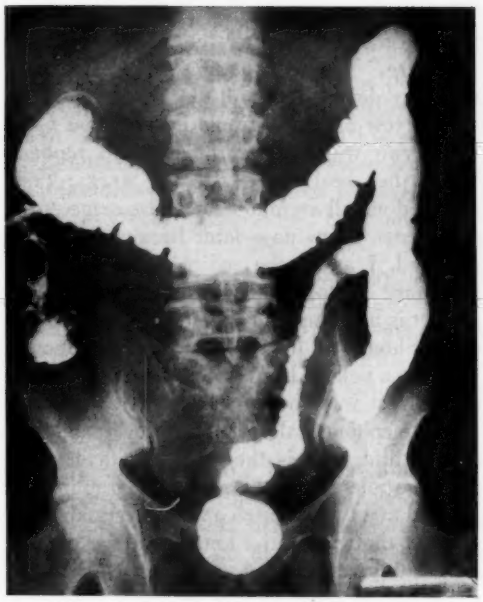

FIGURE 5. Carcinoma of the colon.

FIGURE 6. Ulcerative colitis as a cause of intestinal hemorrhage. The blood passed was red rather than black, and the colonic lesions undoubtedly were the source of the bleeding.

is examined by the radiologist using the hands-off technic or the mild palpatory technic he should not be re-examined. Re-examination frequently is fruitful. There are times when bleeding is present from an ulcer and the site is covered with a crusty clot. You can imagine that it would be practically impossible to demonstrate the presence of an ulcer crater in such an event, whereas several days later the clot may have disappeared and the ulcer crater will be demonstrated.

Figure 4 represents a rather interesting case. The patient, a woman, was sent to us for examination because of massive intestinal bleeding. She had severe melena and she had had a cholecystectomy some weeks prior to the time we saw her. We examined her once and then we re-examined her. The only thing we could find was a slight deformity of the duodenal cap. It almost had the appearance of an extrinsic deformity on the duodenal cap; there was a semilunar-shaped impression on the cap, which was constantly present. We reported this finding but we could not ascertain the presence of ulceration in any portion of the upper gastrointestinal tract, although there was a slightly deformed duodenal cap. The bleeding continued. The surgeons performed a celiotomy and found that at the time of the cholecystectomy a suture had been placed too close to the hepatic artery, weakening its wall, and in the ensuing weeks an aneurysmal dilatation of the hepatic artery had developed. This explained the x-ray defect. I suppose if we had looked very carefully at the time we examined her we might have observed slight pulsation.

In considering massive bleeding from the gastrointestinal tract we also have to include the colon. Most of the bleeding which occurs from the gastrointestinal tract is proximal to the ligament of Treitz. It has been variously estimated that about 85 per cent of the bleeding that occurs is proximal to the ligament of Treitz, involving mostly the duodenal cap; it involves the stomach and also involves the esophagus, as has been mentioned.

An obvious lesion of the right colon is

shown in figure 5. It turned out to be a carcinoma of the colon and actually did cause a great deal of bleeding. Most of the time, colonic carcinomas produce other symptoms than bleeding. Obstruction may occur, but a chronic anemia often is encountered in these patients.

Figure 6 represents a case of ulcerative colitis. Bleeding in these cases can be severe. Note the irregularity of the colonic margins, particularly in the transverse colon where there is a great deal of ulceration. These ulcerations undoubtedly are the cause of the bleeding in this case. The patient had a mixture of bright red blood, red blood and dark red blood rather than the black stool which is seen when the bleeding is in the upper gastrointestinal tract.

DR. OCHSNER: It is gratifying to us as clinicians to know that we can rely on the roentgenologist to help us when these patients are actively bleeding because, as I said before, the roentgenologist and the roentgenographic examination are of utmost importance in diagnosing gastrointestinal lesions.

I was interested in your statement that these patients could be re-examined, perhaps after weeks. Some patients don't live that long, with the type of hemorrhage we are talking about, unless something is done for them. Dr. Pollard, do you want to comment on Dr. Pantone's remarks?

DR. POLLARD: There is one small point I want to bring out in connection with the intestinal x-ray. First of all, as an internist I believe that a roentgenographic examination of the upper gastrointestinal tract can be made in a case of massive hemorrhage at almost any time that the patient is responsive enough to be taken to the x-ray room. However, in a case of a patient who does not have this profound collapse and in which you are still concerned as to the source of the upper gastrointestinal hemorrhage, the point I wonder about is this element of communication between the physician in charge and the radiologist.

About three months ago we had a patient with an upper gastrointestinal hemorrhage for whom we ordered an upper gastrointestinal x-ray. We wrote out the requisition and added, "This patient is bleeding." We underlined these words and then wrote, "Please examine with care." When the patient came back from the x-ray department, out of curiosity I asked him, "How much manipulation did you have while you were down there?" He replied, "Doc, they really gave me the works; they punched me all around." That case came up in conference a few days later because bleeding recurred. I asked the radiologist, "What do you want us to do to let you know that a patient is bleeding and should be handled with care? Should we hang a sign on him? Should we hang a bell on him?" He said, "Really, the only direct way to do it is to give us a personal telephone call or come down and see us." I think that is the most practical point of the whole matter of roentgenographic examination of the upper gastrointestinal tract —to let the radiologist know that the patient is bleeding. After that, maybe Dr. Pantone would tell us what technic he uses.

DR. PANTONE: Usually the requisition reads something like this: "Please do upper gastrointestinal tract examination; patient is bleeding." My colleague in the department of radiology and I will talk to the patient and discuss his illness, and he will tell us that he is bleeding, and we make a point not to handle these patients roughly—we do not maul them or massage them or anything like that; we are very careful. I don't want to malign the department of radiology at Michigan, but occasionally some very ambitious resident perhaps doesn't read the requisition slip carefully. We do read all of our requisition slips.

DR. POLLARD: It is very important.

DR. OCHSNER: We have spent considerable time on the diagnosis of the cause of a massive hemorrhage, and I think for the sake of the record we should emphasize that probably the two most frequent causes of massive bleeding from the colon are polyps and diverticula. These present difficulty in diagnosis—particularly the diverticula.

Treatment

Let us say we have a patient who has had hemorrhage. Sometimes we cannot make a diagnosis, we don't have the proof. The pa-

tient continues to bleed. What are we going to do? Dr. Pollard, what would you do? Here is a man whom you have sent to the x-ray department, and Dr. Pantone reports that there is no evidence of ulcer in his stomach and duodenum. There are no esophageal varices, but the patient continues to bleed.

DR. PANTONE: Excuse me, how old is the patient?

DR. OCHSNER: I will make him any age you want. Let's make him 40.

DR. POLLARD: Are you trying to get me to say that I would call for a surgeon?

DR. OCHSNER: I want to find out what you would do.

DR. POLLARD: Well, I would call for a surgeon. In fact, I should have mentioned that much earlier. I do think the management of upper gastrointestinal hemorrhage should be a joint effort. We do not have the so-called team that some institutions have—an internist, a surgeon, a radiologist and, I think, a pathologist—available at all times to handle the cases of upper gastrointestinal bleeding, but we do have surgeons readily available and we do call on them in the very beginning of such a situation. I think sometimes I call on them just to know where they are—because now and then if you don't know where they are, they may be off operating on your patient.

DR. OCHSNER: Sometimes it is necessary, to save a life.

DR. POLLARD: I like to know right where they are at all times. Now and then we do need them, and then we do need them badly.

In the presence of continued bleeding, when there is no evidence of liver disease, a duodenal ulcer, a gastric lesion of any kind, or a hiatus hernia, one faces a difficult problem. I think the answer depends a great deal on the severity of the situation. In the patient we are talking about, who is 40 years of age, the blood vessels should be good and he should be able to heal and contract. Dr. Coller taught me one thing many years ago which I have always believed very profoundly: Do not operate on a patient for pain or for bleeding. The reason he said that is this: If you start looking through the abdomen for pain you will not find it; if you start looking in the upper gastrointestinal tract for bleeding the chances are you will not find it, unless you happen to be the lucky one.

Not long ago Dr. Henry Ransom and I had a patient, a graduate nurse, whom I had seen six months previously with an established gastric ulcer. She hemorrhaged, and the bleeding stopped; she hemorrhaged again, and again it stopped; she hemorrhaged a third time. I went to Dr. Coller and said, "Will you operate?" He said, "No, I am going out of town, but Henry will do it." So Henry did it. He examined her stomach from top to bottom, and could find not a single source of bleeding —no ulcer, nothing. Dr. Ransom closed the incision. I have followed the patient for six years, and bleeding has not recurred. I cannot tell you the source of the hemorrhages.

Another case which had a similar outcome was that of a doctor's wife who hemorrhaged profusely on several occasions. Dr. Coller eventually operated on her, reluctantly, and examined her entire intestinal tract, including the stomach, small intestine and colon, and found nothing. The patient has not bled since then. I don't mean to say that in every case in which operation is performed and the source of the hemorrhage is not discovered the patient will not bleed again, but these cases raise the problem of the advisability of a subtotal resection. As Dr. Ochsner well knows, Burrell Crohn in New York recommended a few years ago a so-called blind subtotal resection. I will commit myself by saying that I do not favor it.

DR. OCHSNER: Before I talk about this difficult problem, I might comment that in view of the results in the two cases Dr. Pollard described, the operation must have effected a cure. (Laughter.)

Most of the times when a patient comes in with massive hemorrhage we do not have difficulty in making a diagnosis, but the times when we are unable to determine the site of the bleeding do present a difficult problem. I would thoroughly agree with Fred Coller that one should not operate in the face of hemorrhage if one can possibly avoid it, because the mortality is high. It has been our custom, if our hand is forced, to operate, and

in about 75 per cent of the cases we have been able to find the cause of bleeding.

Of great importance, as far as I am concerned, is whether or not the patient is actively bleeding at the time of operation. That tells me more than anything else. I recall operating on a man who had bled many times. Gastrotomy and duodenotomy and examination of the whole intestinal tract were negative except for what appeared to be a hemangioma of the jejunum. I excised this and thought it was the source of bleeding. The patient was about ready to leave the hospital when he bled again. One of my associates operated on him and opened the gastrotomy and duodenotomy wounds, thinking the bleeding might be coming from them, but found nothing. There was blood in the stomach. The abdomen was closed, and the patient was again ready to go home when massive bleeding occurred. I reoperated on him, and because he had blood in his stomach I did a so-called blind resection of the stomach. High up on the lesser curvature was a small penetrating ulcer. That man was subjected to two unnecessary operations without being benefited; at the second operation there was a clue to the true situation, because there was blood in the stomach. Not all massive bleeding comes from a small mucosal ulceration, but I think if there is blood in the stomach at the time, one is justified in doing a blind resection. It is an operation one doesn't like to do, and yet we do it occasionally. We do it probably two or three times a year, and usually are gratified at finding mucosal ulceration. As Dr. Pollard has said, some of these lesions are very small mucosal ulcers; sometimes along the lesser curvature, the so-called gastric pathway, one will find an ulcer, a punched-out ulcer, which will bleed. Then one can cure the condition. If, however, there is no blood in the stomach, gastric resection should not be done. The location of the blood in the intestinal tract is of diagnostic value. Sometimes this is extremely difficult. We perform enterotomies and colotomies and, using a sterile sigmoidoscope, have looked up and down the bowel, especially in the colon. Often we can see a bleeding site.

Now, Dr. Pollard, I would like to ask you what you would do if a patient presents evidence of cirrhosis of the liver and you think he probably is bleeding from esophageal varices. How would you treat him?

DR. POLLARD: This is a really serious problem and, of course, these are the patients who many times slip into hepatic coma, presenting that additional complication. We have the pressure tubes, the intraesophageal pneumatic tubes. We have tried the simple measures of diet, rest, and modest transfusions to try and stop the bleeding; and, of course, there are the surgical procedures to tie off the vessels or to accomplish a portacaval shunt. Dr. Ochsner can discuss those measures much better than I can.

The simple measures I mentioned can be employed in most instances. I think one can feed a patient who is bleeding from esophageal varices just the same as one would feed a patient with a bleeding duodenal ulcer. The patients will tolerate feeding well. You can give them alkalies and can give them modest transfusions. Transfusing a lot of blood is not beneficial, but some blood will keep them going until the bleeding stops. The medical management, I believe, is still as simple as that. Of course one avoids such drugs as morphine, and uses instead a drug which will not diminish respiration, such as sodium phenobarbital. Alkalies, sodium phenobarbital, food and possibly some antisecretory agent —this is about as far as I would go in regard to medical measures. I would use transfusions cautiously.

DR. OCHSNER: Have you had any experience with intragastric chilling to control hemorrhage, as suggested by Owen Wangensteen?

DR. POLLARD: Intragastric chilling goes back some time. I remember that here in Chicago many years ago Dr. Sippy's successor was using intragastric chilling as a means of treating upper gastrointestinal hemorrhage. He would put ice chips down into the stomach. We have not tried this method. I think there is some pharmacologic or physiologic basis for it.

DR. OCHSNER: It is a method that might be tried. We tried it once, and either because of it or in spite of it the patient stopped bleed-

ing. The rationale for it is that hypothermia of the gastric mucosa produces vasoconstriction and decreases the secretory activity.

I would thoroughly agree that the management of patients with cirrhosis should be ultraconservative. These patients are poor surgical risks. They usually have poor hepatic function and they do not tolerate operative procedures well. However, occasionally a patient continues to bleed in spite of the pressure bag; as soon as you take the pressure off they continue to bleed, and then some definitive operative therapy becomes necessary. We have performed almost every one of the procedures which have been suggested but have come to the conclusion that the best thing to do, and the most definitive, is a portacaval or splenorenal shunt. Our results have been better since we have taken this more aggressive attitude, and although the mortality is high it is surprising how many of these patients can survive.

DR. POLLARD: Are you using intrasplenic pressure studies?

DR. OCHSNER: We are, providing the prothrombin is within normal limits. The admonition that you made in this regard is, of course, extremely important. Dr. Davis of our gastroenterologic service does conduct intrasplenic pressure studies if the prothrombin is not abnormal.

Postgraduate Clinical NOTES

149. TREATMENT OF MYOCARDIAL INFARCTION

The tradition of strict immobilization is difficult to overcome; for one reason, the old-fashioned hospitals in this country are not readily adapted to the care of convalescent or semiconvalescent patients, who, when out of bed, are too often regarded as a nuisance. More mobility is justifiable. These patients should be encouraged to feed themselves within a day or two of the onset, to sit up in bed and use their limbs to some extent, even before the end of the first week. By raising the head of the bed on blocks 12-18 in. (30-45 cm.) for a few hours each day, the patient is encouraged to use his legs to overcome gravity. The maintenance of skeletal muscular tone helps to shorten convalescence, reduces the risks of venous thrombosis, and lessens the sense of disability in the convalescent period.

So-called "chair treatment" should not be mistaken for ambulant or active treatment. Anyone who has had experience of sitting, even in a semi-reclining position, for 8 to 12 hours at a stretch, as in long-distance flying, soon appreciates that sitting is more tiring than lying and that sleep is less satisfying in the upright position. Sitting in a chair by the bedside for patients who are relaxed and comfortable and not fatigued by so doing may be encouraged from the third week onward. Physiotherapy may be started as soon as the acute phase of the illness is past.

After four weeks in hospital, the majority should be ready for four weeks' convalescence at home. By the end of that month most should be sufficiently rehabilitated to return to work.

A. Rae Gilchrist, Problems in management of acute myocardial infarction, *British Medical Journal*, January 23, 1960, pp. 215-219

Observations on the Fluoridation Controversy

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Anglesey, Wales

The issue of fluoridation has become one of the most emotionally charged public health questions in America at this time. The opponents of fluoridation thrive on the fears of an uninformed public, and more often than not the general practitioner is squarely in the middle of the controversy. He should be, and is, the chief adviser of the private citizen as regards matters of health. His word should and does carry great weight whenever a health issue comes up before the people, be it in town meetings, in referendums, or in public hearings before legislative action.

Because of this involvement of physicians in this issue, it seemed worthwhile to have a short series of articles reviewing the known facts about the usefulness and the safety of fluoridation, a practice which is undoubtedly the single greatest advance in nutrition as applied to dental health. These facts will be presented by a biochemist. Because public debate is not confined to technical lines and because the practitioner is all too often unprepared for the bewildering, emotional arguments raised by antifluoridationists, it appeared important to also include in this series an article by a physician who has given particular attention to the emotional side of the controversy and the psychologic characteristics of those opposing fluoridation.

Because opponents of fluoridation question the feasibility and cost of fluoridation, particularly in large cities, it also appeared useful to have a report by a sanitary engineer who is familiar with the aspects of the subject. It is my hope as advisory editor for nutrition that this series will help the practitioner when faced with the issue of fluoridation.—Jean Mayer, Ph.D., D.Sc.†

THE fluoridation of water supplies as a means of controlling dental caries is attracting increasing interest in Great Britain. Before long, the first reports should appear from our three pilot schemes, and if these indicate that an appreciable reduction in caries is obtained under current conditions in this country, the subject will become generally an active issue.

It is clear from the recent history of fluoridation that unless adequate preparations are made beforehand this promising means of improving the public health may well suffer a serious setback. In two areas in England, Darlington and Andover, plans for fluoridation have had to be abandoned; in the latter, the plan had operated satisfactorily for two years. In other areas in Britain proposals to fluori-

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date water supplies have encountered opposition. The pattern of events in Britain seems to be repeating that in the United States, where, although currently 36 million people are using fluoridated water supplies, there have been many instances of plans being discontinued and of referendums resulting in adverse decisions. In Canada the measure is illegal in the province of Ontario (although, by some curious quirk, the pioneer plan in Brantford is still being allowed to operate) but permissible in neighboring Quebec. In New Zealand, also, the opposition has temporarily succeeded in delaying the application of the measure, although an impartial Royal Commission reported favorably on fluoridation on all counts.

G. WYNNE GRIFFITH

At first sight, it may appear surprising that there should be any controversy surrounding a subject which has been endorsed by an overwhelming majority of expert opinion. Nevertheless, a small number of people have sometimes succeeded temporarily in creating the impression that in its technical aspects this is a highly controversial matter on which experts have a wide area of disagreement.

As a social phenomenon the fluoridation controversy has not been sufficiently studied for anyone to predict which communities will suffer from serious dissension and which areas will escape it. My purpose in this paper is to examine certain aspects of the controversy with a view to discovering what needs to be done if the activities of a few misguided people are not to be allowed to deprive future generations of children of the benefits of this new advance in preventive medicine.

Generators of Controversy

The active opponents of fluoridation in Britain are few in number. Time and again, wherever the question is raised, we find the same people writing letters to the local press with the object of initiating controversy and of fostering local opposition. For the most part they are people with no scientific training or background. They therefore have no difficulty in persuading themselves that the great mass of scientific evidence on which fluoridation is founded has no validity. They will accept the views of any person of like persuasion, however doubtful his credentials, while rejecting the considered statements of reputable groups such as the World Health Organization and the Medical Research Council.* Their handicap is betrayed by the comic chemistry which some of them propound. "He [the local M.O.H.†] confuses fluor*ine* and fluor*ide*," said one correspondent recently, and went on to explain, "Fluorine is natural; 'N' is for nature. Fluoride is poison; 'D' is for death." Some of them indeed really seem to believe that fluoridation will actually do harm to teeth. It is characteristic that they should be opposed also to smallpox and poliomyelitis vaccinations and the pasteurization of milk. Indeed, the active antifluoridationists and their recruits are usually well known locally for their record of dissenting over many other issues. They are the ideologic descendants of those who in their own day opposed chlorination, anesthesia in childbirth, and other advances in the social application of medicine.

Even so, there are a few trained scientists to be found among the opponents. Generally, they object because they have certain reservations concerning the scientific evidence; however, these views are not shared by the majority of their scientific colleagues. In their chosen scientific field, whatever it may be, they seem characteristically to plow a rather lonely furrow. It is not altogether surprising therefore that some of these scientists are

*The Medical Research Council (M.R.C.), largely although not entirely financed by the government, is composed of men who are acknowledged leaders in the field of medical research. It could be regarded as the counterpart of the National Research Council in the United States.

†M.O.H.—Medical Officer of Health. Every local authority (city, county, etc.) is required to appoint a full-time medical officer with a postgraduate qualification in public health to advise the council on all health matters and to administer environmental and personal health services in the area.

prone to make what many would regard as a somewhat ostentatious parade of their independence of thought.

Characteristically, the opponents of fluoridation are inherently suspicious, given to the imagining of conspiracies and the "smelling of rats." Sometimes, their suspicions take concrete form. At other times the persecution complex is expressed in more nebulous terms. The objections are frequently irrational, for example, the demand for a "pure and unadulterated water supply." As anyone who has ever visited a waterworks must know, such a commodity cannot be supplied.

Confusion of thought sometimes results in objections that are mutually contradictory. Fluoridation obviously cannot be a conspiracy on the part of both the Kremlin (aimed at communist world domination) and the Aluminum Company of America (to find an outlet for the industry's by-products). People who believe that fluorides even at one part per million are dangerous cumulative poisons should not in the same breath advocate the administration of tablets to children as an alternative.

The irrational element in the opposition's attitude has roots which penetrate deep into human psychology. Most people probably harbor an unconscious animosity against authority (deriving perhaps from the frustrations of infancy) which may demand expression from time to time. In modern technologic society these feelings easily attach to the scientist and to the machine. We can recognize this attachment in its more extreme form in outbreaks of mob violence and vandalism such as occurred in the early phases of the industrial revolution. A more innocent expression of the same thing is the perverse delight most of us have experienced at some time or other when we see a machine fail to work as it should.

The stock picture of the scientist in the strip cartoon—devoid of human feelings, surrounded by mysterious gadgets, powerful, malevolent, the very incarnation of menace—is a stereotype that elicits a prompt response at some subconscious level in the minds of many men and women. The majority of people must be able to keep these latent antagonisms under control; otherwise, life in industrialized society would be impossible. In some persons, however, these feelings are persistent and obtrusive. To judge from their writings, many of the opponents of fluoridation are troubled excessively by morbid anxieties of this kind. There also are people who have found life so unrewarding that they have developed aberrant and abnormal values. For example, the person who, for the sake of his own religious tenets, is prepared (although the consequences be fatal) to deprive his children of medical treatment has much in common with those opponents of fluoridation who would deprive a generation of children of a healthier dentition as long as they can win a hollow "victory for freedom."

Finally, we must recognize that there are some opponents who are in it "for the percentage." In the United States, certainly, some people have made opposition to fluoridation a very lucrative business.

Technics of Controversy

In its essence, the opposition's technic is simplicity itself, to create doubt and to generate fear. With a subject so technical in some respects, it is easy to raise a multitude of questions and leave the public wondering. Belief depends on many facts, all pointing to a common conclusion, and may be upset by one contrary piece of evidence. Thus, our confidence in the safety of fluoridation is based on a synoptic view of evidence deriving from many different sources (animal experiments, studies on human volunteers, industrial toxicology, population surveys, analyses of vital statistics, etc.). If we can be made to doubt any of this evidence our confidence will be shaken, so we find that the wildest of allegations, thoroughly discredited long since, may serve effectively to undermine confidence if addressed to a new audience.

For good measure, new "hares" must be raised all the time. Anyone acquainted with the subject can see that the allegations are often obviously inaccurate. A recent statement, for example, that water engineers find it "impossible to maintain a regular level of

fluoride in the water" is just not true, as experience in the United States[1] and in Great Britain[2] has proved. It was stated in this country recently that Chicago had rejected fluoridation, whereas in fact Chicago has been fluoridating its water supply for some years. Sometimes the presentation is more oblique. Consider the following statement: "It has been alleged by United States Congressman Miller that the mortality in one of the test towns (Grand Rapids) from heart disease and nephritis has increased alarmingly since fluoridation started." This statement, which is taken from a letter to a local paper in Great Britain, is true. Such allegations *were* made by Congressman Miller. However, to leave the matter there is to indulge in the reprehensible practice of misrepresentation by suppression, because the allegations were at once shown to be unfounded,[3] and the statement quoted (although in itself true) only serves to give currency to an untruth.

Untruths and suppressed half-truths are not the only stock in trade of opponents to fluoridation. Sometimes, the questions raised are nothing better than flights of fancy. It has been alleged, for example, that President Eisenhower's heart attack was caused by the fluoridation of the water supply of Washington, D. C. This view is apparently not shared by the patient himself, because President Eisenhower has lent his immense prestige to the support of fluoridation in a message to the American people.

The other main tactic is to instill fear. The opponents are quite capable of appealing to those irrational elements which, if we dig deep enough, may be found buried in the psyche of each one of us. The irrational dread of the scientist and the machine has already been mentioned. It is to this nameless fear that references to "fluorine being incorporated in nerve gases" is directed. Among the organic phosphorous compounds which are capable of inhibiting the action of cholinesterase, there are some (fluoroisopropoxymethylphosphine oxide is one) which contain a fluorine atom. To suggest a consequent connection with the fluoridation of water supplies is disingenuous, to say the least. "With fluoridation machines at the reservoirs the population could easily be wiped out," is another example which appeared in a British newspaper. This is irresponsible nonsense. The equipment that operates in my own county (Anglesey), for example, is physically incapable of delivering more than two parts per million in the final water. The most a saboteur could do therefore would be to produce a moderate degree of mottling in a proportion of children, provided of course that he was able to continue his activities without interruption for a period of several years!

The more primitive the fear that can be invoked the better. One of the most primitive is the fear of mutilation. When a referendum was being held in a certain Connecticut town, the opponents inserted an advertisement in the local paper showing photographs of children with gross mottling. The caption read, "Do you want your children to have teeth like these?" It subsequently transpired that the photographs had been taken at a town in Arkansas which had 14 parts per million in its water supply. Equally primeval is the fear of castration. In the same town an attempt was made to carry the referendum by spreading a rumor on the day of voting that fluoridation rendered people sexually impotent.[4]

Countering Controversy

There is obviously a formidable task to be done if a small, determined opposition is not to be allowed to succeed in its objective of preventing the general application of this beneficial measure. This task may be regarded as consisting of three parts, which I shall call information, motivation and reconciliation.

It was shown in a Gallup poll in the United States some years ago that the majority of adults *who had heard of fluoridation* were in favor of it. In other words, knowledge was in itself sufficient to carry conviction in many instances. But, at the same time, the poll showed that nearly half the adults interviewed had not heard of fluoridation. The first objective therefore must be the communication of information.

To be successful, communication must extend through all levels in society, and the

presentation obviously must be appropriate to the group being addressed. For instance, the historical approach is most effective with lay audiences, and when they learn of the naturally occurring variations in the fluoride content of water supplies that have existed for generations the word "experiment" loses its dreadful associations. Everyone who has a legitimate interest in fluoridation must be brought into the picture. More than one plan has foundered because the water engineer was ignored, and there is no more damaging opponent than a local doctor or dentist whose opinion was not sought at an early stage. There are other professional groups whose interest should be enlisted, for instance, sanitarians, teachers, nurses and the clergy. In fact, in this job of informing people and thereby enlisting their interest, we cannot cast the net too widely.

Although information is important, it is not always necessarily enough. To accept innovation, people must have an adequate motive. We have hitherto perhaps tended to neglect this obvious truth. People do not install television sets in their homes because they have acquired a profound knowledge of electronics. They do so because they think a television set will satisfy a need that they feel. We are confronted by difficulties in this regard arising from the very ubiquity of dental ill health and the fact that dental disease is not a main cause of death. (Even so, in 1957 there were more deaths in England and Wales due to disease of the teeth and gums than there were due to, for example, any one of the following dreaded obstetric complications: placenta previa, ectopic gestation and puerperal sepsis.)

There is no drama in dental health. We must therefore set out to foster an awareness of the need for preventive measures in this field. We must strive to give people a positive goal not only by stressing the immense size of the caries problem but also by reminding them of the humanitarian aspects; namely, that to prevent unnecessary pain in small children is something worthwhile and that the physical and the psychologic harm that can result from bad teeth, malocclusion and improperly developed mandibular structures can be largely prevented.

What limited appeal dental health may have is probably aesthetic rather than hygienic, and we must recognize and make use of this fact. We should not be content with getting people to accept fluoridation; our aim must be to get them to demand it. We should seize the initiative so that the opponents are obliged to answer our arguments instead of our having to deal with theirs. The major theme should be of our choosing and it should be the positive goal of improved dental health for the next generation.

Motivation calls for the technics of communication just as much as does the dissemination of information. Communication takes time. The opponents necessarily rely on scare technics, and these are difficult to sustain. It is some years now since anyone tried to frighten the population of Anglesey by saying that cancer, kidney disease, mongolism and apoplexy would follow the implementation of our plan of fluoridation. Thus, time is on the side of progress, provided that no snap decisions are made. This being so, it may sometimes be necessary to play for time. A hasty decision on fluoridation or, for that matter, on any other innovation is likely to be a contrary one.[5]

Just as information alone may not be enough, so motivation may be ineffective without what I have called, for want of a better name, reconciliation. In one American community where a fluoridation referendum was studied by sociologists, it was shown that the arguments that carried the most weight with those ordinary citizens who intended voting against the measure were the ethical objections.[6] It is significant that in this country the opponents of fluoridation are tending to lay more stress on these arguments and less emphasis on the more purely technical objections. One reason for this switch of emphasis is, of course, that wildly inaccurate assertions on matters of fact cannot be sustained indefinitely, but there may be other reasons for it.

Some of those opposing fluoridation are actuated by the highest motives, because they value those ideals of freedom and of respect

for the individual to which we would all subscribe. If a conflict of motives is not to arise, it is necessary to reconcile in the minds of ordinary people these high ideals with the measure we are proposing. The procedure in its essence requires that A, an adult, and C, a child, do something so that C but not A may benefit. The overwhelming consensus of experts holds that what A has to do will not harm him. Nevertheless, it might be contended that we have no moral right to ask A to agree, although C's need may be great, unless we are satisfied that there is no other way of conferring the benefit on C except with the compliance of A.

This brings us to a consideration of the alternatives of water fluoridation. Can the caries problem be solved or at least substantially alleviated without fluoridation? How long would it take to effect the necessary alterations in the dietary habits of the nation and to raise generally the practice of oral hygiene? We should certainly strive to do these things, but if we are realists we will not expect any radical improvements to follow quickly on our efforts in these directions. If that is a correct assessment of the position the question remains, can the beneficial effect of fluoride be mediated in some way other than through the water supply? Topical application; the use of tablets or of concentrated solutions for individual administration, and the fortification of bread, salt and milk have been suggested as possible alternatives. At least some of these methods are being investigated at the present time in different countries. But there are many questions relating to the efficacy and safety of these various alternatives which need to be considered, and of necessity many years must elapse before satisfactory answers can be given.[7]

Bearing in mind the need for a regular daily adjustment of fluoride intake from early fetal life to the age of eight or nine years it can be stated categorically that there is no practicable alternative which could be recommended at the present time on anything but a very restricted scale. For the majority of children it is now (and is likely to be for many years to come) a case of water fluoridation or nothing. The moral dilemma which confronts A is therefore inescapable. If he does not accept this harmless increment in his daily fluoride intake, C is to be deprived of a benefit he might otherwise enjoy. It is no longer a question of whether we have a right to ask A to agree but rather whether there remains for A any morally tenable grounds for withholding his consent.

Man has been defined as a social animal, and social organization is possible only to the extent that the individual is prepared to subjugate his personal inclinations and desires for the sake of the common good. The individual in society is not and never can be free to do as he wishes. The price of social existence is to be measured in "freedom." But freedom is not something static and fixed. It is organic and capable of growth, so that we may lose one freedom in order to gain a larger one. Many instances might be quoted to illustrate this truth. People in smokeless zones can no longer burn coal in the old-fashioned way. Those particularly partial to a coal fire might wax eloquent on this loss of freedom. But the freedom to enjoy the good old-fashioned coal fire has been surrendered so that a greater freedom might be attained —freedom from the ills caused by atmospheric pollution. It is a moot point whether there ever was such a thing as a freedom to have a fluoride-free water supply. Even if it existed, it was largely dependent on accidents of geology. But even if there were, it is a freedom that, relinquished, yields to a larger freedom—a freedom to enjoy better health.

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Self-help Devices:

Selection of Wheel Chairs

Modifications Based on Disability

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SELF-CARE for the patient who is completely or partially confined to a wheel chair primarily involves transfer, the method by which he shifts his entire body from one place to another. In selecting the wheel chair that will permit the patient to be as self-sufficient as possible, the physician must consider those modifications (variations from standard construction) and accessories† that will meet the patient's specific needs. What the patient can do and his method of doing it are, of course, contingent on the nature and severity of his disability.

Because most modifications cannot be made after the chair has been delivered from the factory, it is incumbent on the physician to anticipate the patient's specific needs as accurately as possible when writing the original prescription. The prognosis should be carefully weighed and, in diseases characterized by progressive loss of muscle strength, it may be economically wiser to order more modifications rather than less to avoid having to buy a new chair later. It may also be practical to defer prescription until the illness has reached a plateau and to rent a chair during the interim.

*Supported at the Institute by the Arthritis and Rheumatism Foundation.

†To be discussed in next article of this series.

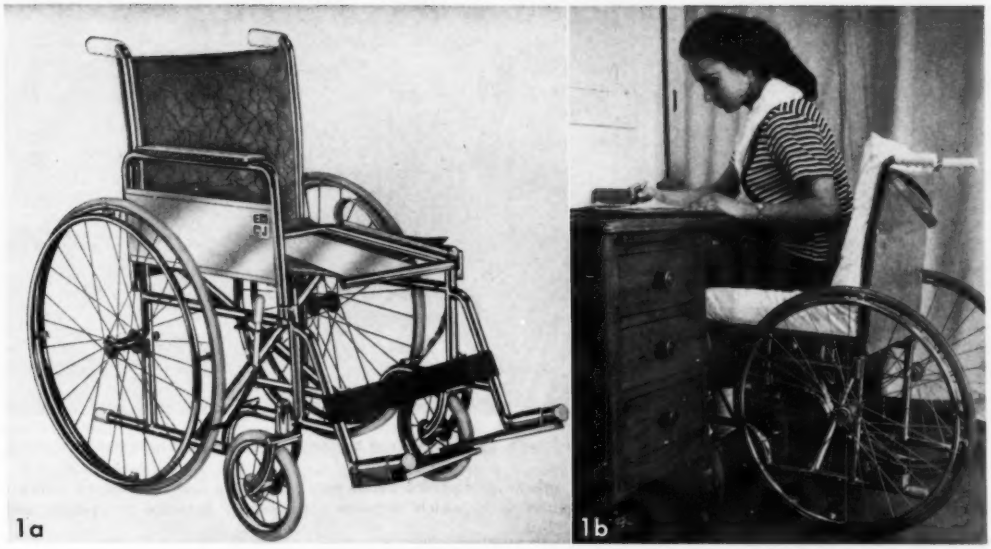


FIGURE 1. Unless otherwise specified, wheel chairs are fitted with stationary, regular-style arms, which are about 9½ in. high. Detachable arms (a), however, should always be considered because they expedite transfer sideways between the wheel chair and other furniture or equipment, insuring greater safety; they permit a closer approach to working surfaces (b); they are always offset from the chair seat, thereby providing an extra 1½ in. of sitting space, and they may be ordered in various heights to meet individual needs.

It is important to select detachable arms for patients with severe and permanent disability such as paraplegia or quadriplegia, traumatic or otherwise, because these patients usually transfer in and out of a chair sideways.

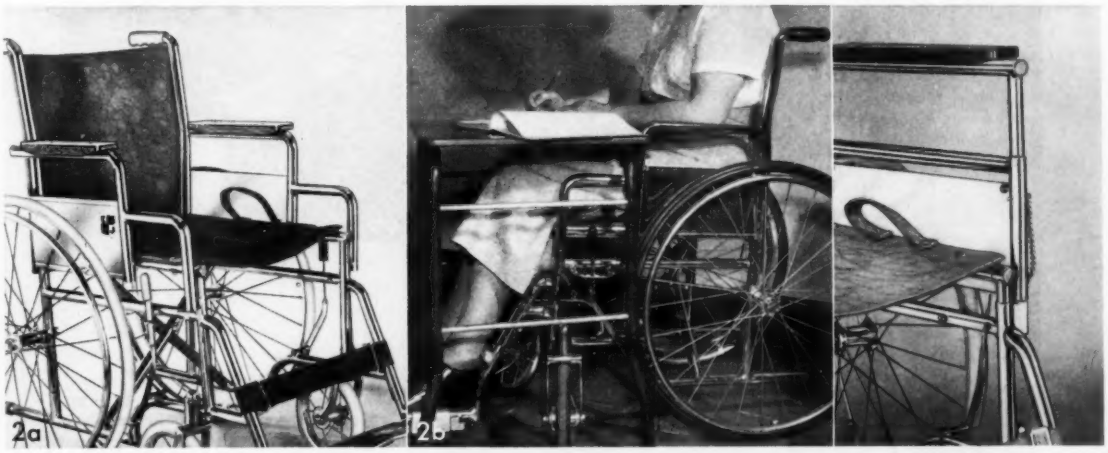


FIGURE 2. The choice between regular-style and desk-type arms (a) is usually a matter of preference. The desk type permits a closer approach to working surfaces without having to be removed (b). When the wheel chair is used for support in getting to a standing position, the desk-type arm can be reversed so that the jog end is in the back; however, this may be an inconvenience.

FIGURE 3. Skirtguards should be included in the prescription because they protect the clothing from becoming entangled in the wheels and soiled.

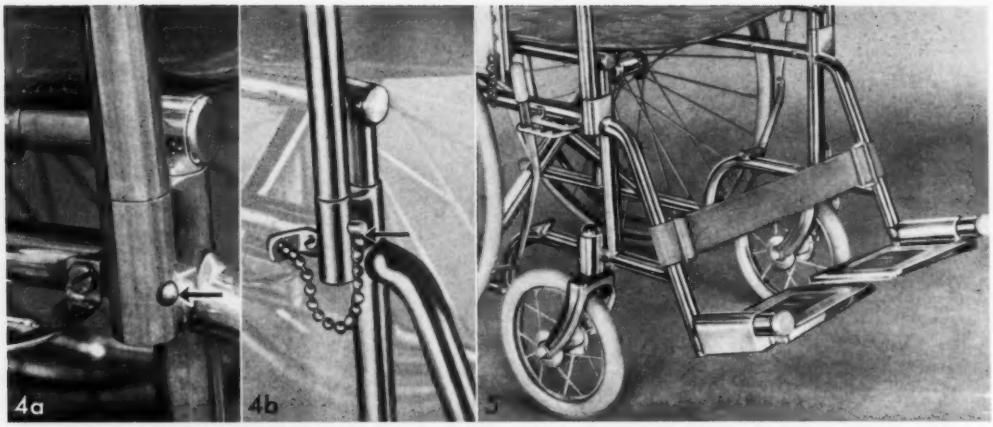
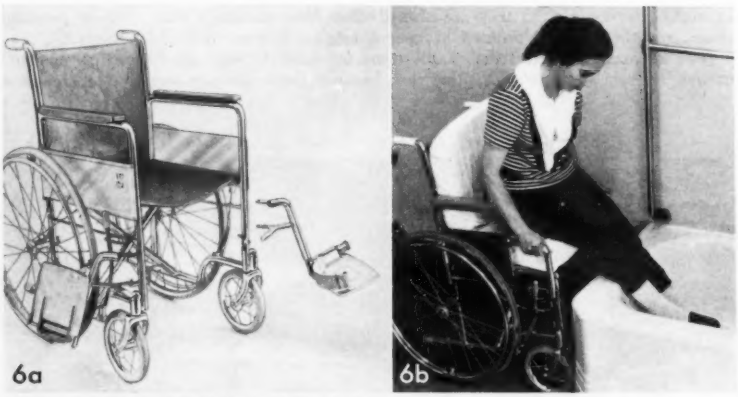


FIGURE 4. All detachable arms should be equipped with locks to secure the armrest in place. There are two types, the button lock (a) and the pinlock (b).

Although patients with slightly weakened or otherwise disabled hands may sometimes find the pinlock difficult to close, it is still generally preferred to the button lock, which requires considerable pressure to operate and often bruises the skin.

FIGURE 5. Some patients can use standard footrests. These are stationary and have about a 6 in. adjustability in length (distance from knee to heel). The footplate can be folded upward.

FIGURE 6. Detachable, swinging-out footrests (a) may be either removed or swung out of the way to permit a closer approach of the chair to other furniture or equipment (b). When the footrests are completely removed, the over-all length of the chair is reduced, making storage easier.



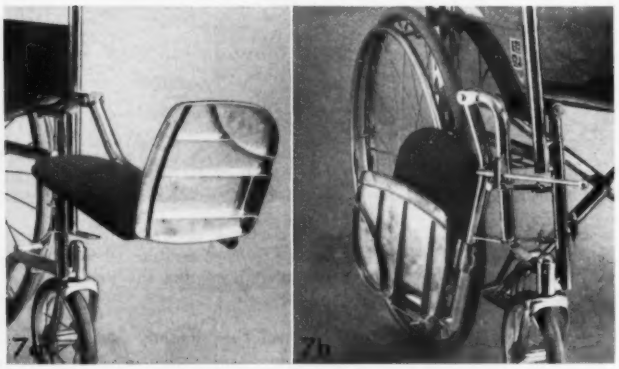


FIGURE 7. Elevating legrests (a) are always an advantage for patients whose legs must be in a raised position. These legrests should also be detachable and swing out (b) to provide the advantages of the footrests previously described.

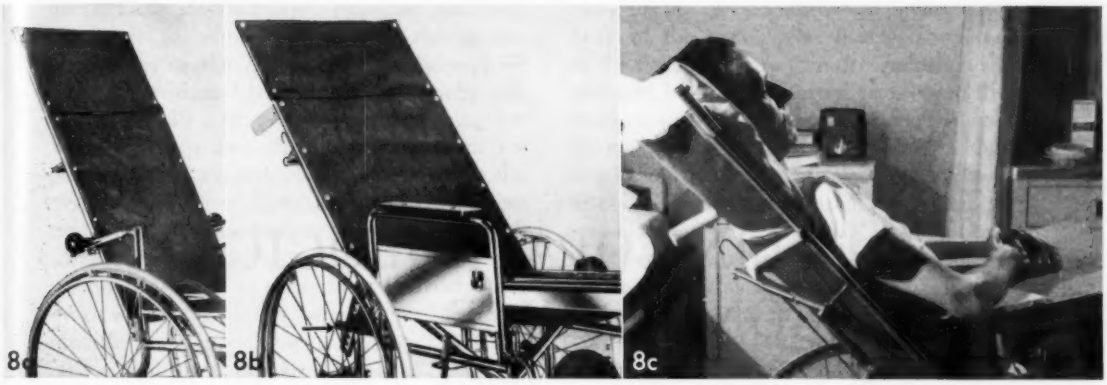


FIGURE 8. The standard wheel-chair back rest is about 16 in. long. There are also semireclining (a) and full-reclining (b) back rests. The former permits a recline of 30 degrees only. The latter allows the patient to be positioned at any angle from sitting fully erect (90 degrees) to completely supine (180 degrees).

Chairs with either type of back rest should have both a removable headrest (c) and elevating legrests.

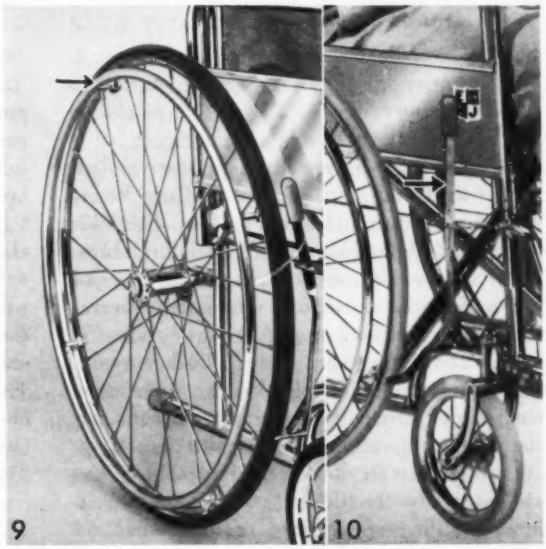


FIGURE 9. Hand rims should always be ordered, because they protect the hands from direct contact with the soiled wheels when propelling the chair.

FIGURE 10. While brakes to lock the wheels are essential for general security, they are especially necessary to lock and stabilize the wheels when the patient is transferring in and out of the chair.

Unless otherwise specified, the chair will be fitted with standard rubber tires, 24 in. wheels, and either 5 or 8 in. casters (the pivot wheels). As mentioned previously, the 8 in. caster offers better security because it rolls more easily over rough surfaces and obstructions, and it swivels more freely than the 5 in. caster. The larger wheels should always be in the rear (Universal model chair) for closer approach in transfer activity. Whether the chair should be fitted with other than standard-sized wheels and tires will be discussed more thoroughly in the article on accessories.

CLINICOPATHOLOGIC CONFERENCE

Report From Veterans Administration Hospital, Hines, Illinois

Edited by William J. Gillesby, M.D., Assistant Chief, Surgical Service

Case Report

A 60 year old white, retired printer was admitted to the surgical service at Hines Veterans Administration Hospital on June 29, 1957, because of abdominal pain of 24 hours' duration. Six weeks prior to admission, he had had a three day episode of moderately severe, intermittent, colicky pain in the lower left side of the abdomen; there were no other symptoms, and the pain subsided spontaneously. On the day preceding his admission, the patient had a nonradiating, intermittent, aching, cramping pain in the lower right side of the abdomen. By the time he was hospitalized, however, the pain seemed to have localized in the lower left quadrant just superior to the inguinal ligament. The patient said that he had had slight anorexia and nausea but no vomiting, change in bowel habits, weight loss, or fever during the present illness.

History revealed that the patient had had slight hemiparesis on the left side following a cerebral thrombosis in 1951. Orthopnea, which necessitated his sleeping on two pillows, and dyspnea and precordial pain on exertion (the latter relieved by nitroglycerin) had been present for an unspecified length of time. The patient had taken a preparation of digitalis for one month before being admitted to the hospital; however, details concerning the digitalization and maintenance dosages were not elicited.

Examination showed that the patient was well nourished and in moderately acute distress. Temperature was 100.6° F., pulse 84 and irregular, and blood pressure 160/100. The head, neck, eyes, ears, nose, pharynx, chest and lungs were normal. The heart did not appear to be enlarged; the tones were distant, and a basically regular rhythm with frequent premature contractions was noted. The abdomen was scaphoid and soft. Neither tenderness to palpation nor rebound tenderness was present. Bowel sounds were normal. The liver, kidneys, spleen and bladder were not palpable. The rectum was normal and contained brown stool. Neurologic examination gave normal findings except for a slight decrease in motor strength in the left arm.

Hospital course—Initial treatment consisted of bed rest and administration of 0.1 mg. digitoxin daily. The patient was placed on a clear liquid diet. Three 50 mg. injections of

meperidine hydrochloride provided sufficient analgesia to allow him to sleep during his first night in the hospital. An additional 50 mg. meperidine hydrochloride was administered at 9:30 A.M. the following morning for slight dyspnea and apparent pain. Except for having a temperature of 100.4° F. during the second evening of hospitalization, the patient remained afebrile. Severe abdominal pain occurred during the second evening, and two 50 mg. injections of meperidine hydrochloride were administered. The pain persisted throughout the morning of the third day (July 1), and at 2:35 P.M. the patient had a "tonic convulsion associated with unconsciousness, fecal and urinary incontinence and a profuse diaphoresis." Examination disclosed no neurologic defect. Blood pressure was 160/100; the pulse rate was 108 and regular; and the lungs, abdomen and stool were normal. At 5 P.M. the patient did not complain of pain, but he appeared rather pale. Blood pressure was 80/60 and pulse rate was 120. Results of an electrocardiogram made at 5:45 P.M. were interpreted as showing an acute myocardial infarction of the anterior wall. At 6:30 P.M. the blood pressure was 70/60, pulse 150. The patient still did not complain of pain.

A medical consultant who examined the patient reported that a few basal rhonchi were present; heart tones were faint and the abdomen was normal. The patient was transferred to the medical service. Morphine, oxygen, restriction of sodium, and the intravenous administration of 50 mg. heparin every four hours were added to the therapeutic regimen. The patient slept at intervals during the night but sweated profusely. His blood pressure ranged from 90/60 to 104/86.

On the morning of the fourth day of hospitalization, the patient appeared to be improved. He took fluids orally but could not urinate. He was given 2.0 cc. mercaptomerin sodium and 100 mg. DICUMAROL®. At 1:30 P.M. the patient was sweating; his skin was cold and clammy, and his pulse was almost imperceptible. At 1:50 P.M. the radial pulse was unobtainable and respirations were irregular and shallow. The patient died at 2 P.M.

Laboratory data—A posteroanterior chest x-ray on the day of admission revealed tortuosity of the aorta. The transverse diameter of the heart could not be determined because the right border was partially obscured by the thoracic spine and aorta; however, the cardiac silhouette suggested the presence of hypertrophy of the left ventricle. The pulmonary artery segments were prominent, and there was blunting of the right costophrenic angle. The bony thorax and the vascular markings in the lung fields were normal.

An anteroposterior x-ray of the abdomen, made on admission, revealed partial bony bridging between L1 and L2, with minimal hypertrophic changes involving the rest of the lumbar vertebrae. The ascending colon, the cecum and the splenic flexure contained a moderate amount of gas, but the colon was not frankly distended. There was a suggestion of a small amount of gas within the small bowel. Calcification of both iliac vessels was noted, but no radiopaque calculi were seen in the genitourinary tract or in the region of the gallbladder.

An electrocardiogram made on the day the patient was admitted showed a sinus rhythm of 84 per minute; a P-R interval of 0.26 second; slight depression of S-T segments in leads I, II aV$_F$, V$_5$ and V$_6$; diphasic T waves in leads I, II, aV$_L$ and aV$_F$; and inverted T waves in V$_4$, V$_5$ and V$_6$. Deflections of the QS waves in V$_1$ and V$_2$ and of the QR wave in V$_3$ were noted.

On the morning of July 1 an electrocardiogram revealed a sinus tachycardia of 136 per minute with occasional atrioventricular block and nodal escape. The P-R interval was 0.12 second; changes in the S-T segments and the T waves were the same as those in the tracing recorded on the patient's admission. The QS wave in V$_1$ and V$_2$ and the QR wave in V$_3$ were also the same. The S-T segments in V$_2$ and V$_3$ were elevated. Later in the day another electrocardiogram was made which showed the P-R interval to be 0.16 second; the S-T segment, the T wave, the QS wave in V$_1$ and V$_2$ and the QR wave in V$_3$ were the same as in the electrocardiogram made earlier in the day. The S-T segments in V$_2$, V$_3$ and V$_4$ were elevated.

TABLE 1

LABORATORY DATA

TESTS	DATES				
	6/29	7/1			7/2
		A.M.	P.M.	P.M.	
Urinalysis					
Color	Amber	Amber			
Reaction	Alkaline	Acid			
Specific gravity	?	1.010			
Protein	1 plus	2 plus			
Sugar	0	0			
White blood cells per high-power field	1 to 3	6 to 8			
Red blood cells per high-power field	2 to 4	16 to 20			
Casts	Occasional granular	0			
Hematology					
Hemoglobin (grams)	14	13	11		
Hematocrit (per cent)	47	43	37		
Red blood cells (millions)		4.50	3.82		
White blood cells (thousands)	15.9	16.8	14.5	19.8	
Neutrophils	92	86	88	90	
Lymphocytes	7	14	10	10	
Monocytes	1		2		
Erythrocyte sedimentation rate (millimeters per hour)				23	
Prothrombin time (seconds [control: 13 seconds])		13			14
Serology		Negative			

Other laboratory data are summarized in table 1.

Discussion

DR. NORMAN B. ROBERG (professor of medicine, University of Illinois College of Medicine, Chicago): The severe, intermittent, colicky pain which this patient experienced six weeks before he was admitted to the hospital suggests a disease of a hollow viscus; the location of the pain would indicate that it was of either ureteral or colonic origin. The fact that the patient had mild anorexia and nausea but no vomiting or change in bowel habits would seem to show that there was no very severe disease of the bowel. Nausea and vomiting may not appear early in the course of a colonic disease, even in the presence of a volvulus or obstruction; but, if there are severe disturbances of the lower colon or cecum, some change in the bowel habits is expected.

The patient apparently had angina pectoris; however, I can see no reason for his taking digitalis. There was no evidence of pulmonary congestion, and the heart size was quite normal. A certain element of pulmonary fibrosis with obstructive emphysema may have been causing the dyspnea as well as any heart failure. Shortness of breath is not a part of angina pectoris, and both the physical examination and the x-ray findings in this patient do not indicate adequate reason for his being short of breath or needing to use two pillows when sleeping.

The soft and scaphoid abdomen was not consistent with the picture of an obstructive lesion of the bowel with distention or of an inflammatory lesion. The absence of tenderness to palpation and rebound tenderness indicated that there was no peritoneal reaction, and the normal bowel sounds were not concomitant with any inflammatory or severe vascular disturbance of the bowel. There was no reason to suspect diverticulitis, perforative

diverticulitis, acute appendicitis or any form of peritonitis. The intermittency of the pain and the normalcy of the physical examination indicated that there was no recurrent pancreatitis or any form of gangrene or ischemia. If intermittent, recurrent emboli had been causing mesenteric infarction or mesenteric artery embolism to a degree which would produce this severe pain, there would be some vomiting, change in bowel habits, tenderness and rebound. Carcinoma with obstruction, volvulus, or gallstone colic does not seem to fit the symptoms observed in this patient. The stool was described as being normal on at least two occasions; it was not grossly bloody, as would be expected in intussusception or any severe mesenteric embolism.

The tonic convulsion which this patient had apparently was caused by some cerebral anoxic or hypoxic episode. We do not know whether it was caused by an embolism in a cerebral artery, a sudden attack of ventricular tachycardia, ventricular fibrillation with hypotension, Stokes-Adams syndrome, or acute hemorrhage. Whatever it was, some form of acute cerebral hypoxia gave rise to the syncopal seizure. The blood pressure of 160/100 would indicate that severe shock or hemorrhage had not occurred; however, Stokes-Adams syndrome could well have been present at the onset of the attack. The lungs, abdomen and stool were reported as normal, and since this patient was carefully followed, I presume that the stool was negative for occult blood.

About two and a half hours after the syncopal seizure, the patient appeared pale; this pallor, with the blood pressure of 80/60 and the increasing pulse rate of 120, suggests that a hemorrhage had occurred. Except for the basal rhonchi noted by a medical consultant a short time later, the patient's condition had not changed appreciably from that at the time of admission.

A review of the electrocardiograms shows that in the first tracing, made on the day the patient was admitted, there was a prolonged P-R interval and some S-T depression. The R waves were absent in V_1 and V_2, although the T waves were diphasic in both V_1 and V_2, which suggests that the electrode was in practically the same position for both leads. When the contour of the T wave is the same in V_1 and V_2, the persistent absence of the R wave is less significant. The deep QR wave in V_3 suggested so-called septal or anteroseptal infarction, with some elevation and coving of the S-T segment. The depression of the S-T segments in V_4, V_5 and V_6 were rather nonspecific.

In the first electrocardiogram made on July 1, there was a strikingly shortened P-R interval. It is debatable whether this indicated a change from first-degree heart block to no heart block or whether it represented a high nodal rhythm. It might well have been a high nodal tachycardia. This tracing showed practically the same configuration of the T wave in V_1 and V_2 as did the first electrocardiogram; the R wave was still absent and the S-T segments were a little more elevated. There was a greater elevation of the S-T segment in V_3, and the T wave was inverted. However, except for the last-mentioned observation, there was no striking change from the V_3 tracing of the preceding electrocardiogram.

The only appreciable change observed in the third electrocardiogram was in V_3, in which the S-T segment was a little bit more elevated than in the former tracings. One could question the advisability of making a diagnosis of a new acute myocardial infarction based on the fact that the changes in the V_3 lead had become a little more striking. The basic pattern was not changed; the deep QR wave and the elevation of the S-T segment were still present. When a patient has had an episode of shock and convulsion, when the heart rate has become markedly elevated, and when there is evidence (from both the history and the electrocardiograms) of old, occlusive atherosclerotic disease, moderate changes without structural changes in the electrocardiographic pattern are not unusual.

The x-ray of the chest was not remarkable. The prominence observed in the pulmonary artery segments may have been due to the presence of cor pulmonale or to the fact that the lung fields were translucent.

The anteroposterior view of the abdomen showed nothing to suggest either a segmental

or prolonged area of obstruction in the intestine. There were no patchy pockets, which sometimes occur with peritonitis, and there was no evidence of ileus, which might be expected with mesenteric infarctions. The genitourinary tract and the gallbladder region contained no radiopaque calculi, and I think there is no need to consider that this patient might have had gallstone ileus. Ordinarily, in this condition there is very severe pain in the upper abdomen, evidence of peritonitis, and severe nausea and vomiting.

Results of the urinalyses were not unusual. The 1 to 2 plus proteinuria may occur in a person of this age who has atherosclerotic cardiovascular disease. It was stated that some granular casts were seen in the first urinalysis, but there were none in the second. This observation makes me wonder if a thorough examination for casts was conducted in the second urinalysis, since in the presence of 2 plus albuminuria some casts usually are noted if the urine is acid and the centrifuging is done gently. It would have been most helpful to have known whether or not there were any red cell casts; if red cell casts are present, there is bleeding from the glomeruli and casts are being formed in the tubules. This would indicate ischemic, inflammatory or embolic glomerulitis. The fact that 16 to 20 red cells were observed on urinalysis indicates that this patient had difficulty in voiding. This could have been caused by a little oozing of blood from prominent veins over an enlarged prostate and could have indicated trigonitis. We cannot say whether the red cells came from the lower or upper portion of the urinary tract.

The hematocrit dropped from 47 to 37 per cent, and a mild leukocytosis was present. Thus, there was some evidence of blood loss, which may have been greater than we knew because of dehydration; the rapid pulse and excessive sweating on the day the patient died also may have indicated this to be true. The drop in the hematocrit is probably the most significant finding in the laboratory studies; it suggests blood loss as the reason for the drop in blood pressure and the presence of tachycardia rather than acute myocardial infarction with failure.

A patient with myocardial infarction who is in the state of shock, who has the severity of pain in the lower abdominal region, and who has the degree of tachycardia and the decrease in blood pressure seen in this patient ordinarily would not live for 36 hours. There usually would be evidence of congestive heart failure, and for that reason I do not believe that the shock and tachycardia observed in this patient were caused by myocardial infarction. I am much more inclined to believe that this man's death was caused by hemorrhage and that the pain was related to this bleeding. Since there was no evidence of external hemorrhage, the bleeding must have been internal. The patient was not hemorrhaging from the gastrointestinal tract or the lungs; thus, we should consider the possibility that he had retroperitoneal bleeding. This could have been caused by some form of rupture of the aorta.

The patient did not have the sudden, intense pain in the flank or the upper quadrant which occurs when a kidney ruptures when there is severe hemorrhage in the hilus of the kidney in conditions such as periarteritis nodosa. The type of pain which this man had, starting in the left lower quadrant six weeks before he was hospitalized, then occurring in the right lower quadrant one day before hospitalization, and localizing in the left lower quadrant by the time he reached the hospital, would suggest that blood was oozing from the abdominal aorta.

There is adequate evidence for considering two possibilities: (1) an atherosclerotic aneurysm of the abdominal aorta with direct rupture, which sometimes will produce intermittent bleeding, or (2) the classic dissecting aneurysm of the aorta with an idiopathic necrosis. In this case, there is more reason to believe that this was an atherosclerotic aneurysm. The cerebral thrombosis, coronary disease and calcified iliac vessels are consistent with this picture.

It is possible for a dissecting aneurysm to begin in the abdominal aorta, sometimes in the iliac bifurcation; however, some 80 to 90 per cent of these begin in the ascending aorta and then dissect downward. A dissection of the aorta can be entirely painless, although

there is usually very severe pain going through to the back and progressing downward. When dissection occurs without pain, the first evidence of the condition is sudden death from hemorrhage or pain when the hematoma ruptures into either the mediastinum or the retroperitoneum. If it ruptures into the pericardium, the patient dies suddenly, as this patient did. However, the fact that this man's pain occurred most generally in the lower abdomen indicates to me that he had bleeding from an atherosclerotic aneurysm of the abdominal aorta. The chief disease, if it does occur in the abdominal aorta (even if there is any syphilitic involvement going down into the abdominal aorta) is atherosclerotic.

I think that the syncopal episode in this patient can be explained by the fact that he probably had some degree of carotid-vertebral stenosis on an atherosclerotic and thrombotic basis, since the convulsion occurred with an initial period of either paroxysmal tachycardia or shock. Because of the intermittency and the severity of the abdominal pain and the normalcy of the abdomen and the function of the gastrointestinal tract, I am inclined to believe strongly that this disease was not intrinsic to the lumen of the gastrointestinal tract and was not related to any of the solid organs such as the pancreas. I would ascribe the presence of anemia and shock and the suddenness of death to rupture of an atherosclerotic aneurysm of the abdominal aorta with retroperitoneal hematoma.

DR. VICTOR R. JABLOKOW (staff physician, laboratory service): Thank you, Dr. Roberg, for a very complete discussion of this case. Does anyone want to ask a question or contribute to the discussion of the diagnosis?

DR. GLOUCESTER PRICE (assistant chief, hematologic and metabolic section): I have several questions I would like to ask. If a dissection of an aneurysm involves the abdominal aorta, would you ordinarily expect the patient would have bowel symptoms? If the hematuria in this patient was a manifestation of a dissection, would you not also expect that bowel symptoms would be present? Do you think that the patient's inability to pass urine might have been on a neurogenic basis because of an involvement of the spinal arteries secondary to the dissection? Lastly, do you think that the dissection might not have been lower than the position which you indicated, Dr. Roberg?

DR. ROBERG: Did you say "lower"?

DR. PRICE: Yes. Might it have been even at the bifurcation?

DR. ROBERG: Yes, it could have been. In regard to your questions about bowel symptoms, I would say that it is a little difficult to evaluate just what the bowel symptoms would be in this case. If bleeding is present, there will be a great deal of retroperitoneal irritation. If the bleeding is low in the pelvis, the patient often will have extreme rectal urgency and sometimes urinary urgency. The irritation in the retroperitoneum will be such that the patient will repeatedly try to defecate or will want to urinate. Sometimes, there is sufficient spasm that the patient cannot pass urine. Dissection of blood into the leaves of the mesentery can be such that ileus will develop. Yet, in this patient there was no evidence of real bowel disturbance. We could hypothesize that there was some cuffing, perhaps of a renal artery via dissection, which would give rise to some hematuria; however, the description of the red cells in the urine and the urinary retention does not impress me greatly.

I am inclined to believe that this patient did not have a dissection, because painless dissection is not common and because the pain was low and did not move. I believe that this was an atherosclerotic aneurysm which ruptured directly low in the abdominal aorta and even involved the bifurcation.

DR. CALVIN RADIN (assistant chief, general medical section): In view of the results of the electrocardiograms, do you believe that the patient had had a recent myocardial infarction?

DR. ROBERG: I think that the absence of the R wave and that the QS wave in V_1 and V_2 are suggestive, although if you look at the P waves, they seem to be much over the same electric field of the heart. The striking QR wave in V_3 and the elevation of the S-T segment would need to be considered pathognomonic of anteroseptal infarction.

DR. RADIN: Do you think that the persistence of the S-T elevation could indicate something more than the semblance of an infarction? In other words, did the patient have an aneurysm in that part of the ventricular wall?

DR. ROBERG: As you know, this has been debated for years. Patients with ventricular aneurysms have shown S-T deviations, especially in the lateral leads, for years. Then we also have had reports of patients with persistent S-T elevations who have had no evidence of cardiac aneurysm and no evidence that their infarct was different from that of other patients. Apparently, in some people the action current of injury, whatever it is, tends to persist.

DR. JABLOKOW: An autopsy was performed about two and a half hours after the patient died. His heart was markedly enlarged, weighing 750 gm. There was some thickening of the mitral valve, with calcific deposits, although there was no real mitral stenosis. The coronary arteries were patent but were somewhat narrowed by arteriosclerotic changes. The left ventricular wall was hypertrophic, and the left ventricle measured up to 2.5 cm. The heart was dilated. There also was some hypertrophy of the right ventricle, which measured 0.7 cm. The lungs were heavier than normal; the right lung weighed 620 gm., the left 430 gm. There was evidence of emphysema and there were some chronic fibrotic changes. Approximately 200 cc. of pleural fluid was present bilaterally. The kidneys were not remarkable.

The peritoneal cavity contained approximately 300 cc. of bloody material, but most impressive was the very massive retroperitoneal hemorrhage which was coming from a rupture of an abdominal aneurysm just 1 cm. above the aortic bifurcation between the renal arteries, which were not involved. The aneurysm measured about 10 cm. in diameter and was approximately 5 cm. in length. The ascending and descending portions of the aorta were markedly arteriosclerotic, and there were many atheromatous ulcers with some calcific deposits. The inferior and superior mesenteric arteries and the celiac artery showed arteriosclerotic changes. Benign prostatic hypertrophy also was present. The rupture of the aneurysm occurred in the retroperitoneum; the area of the perforation measured approximately 2 cm. and was on the left side posteriorly. The aneurysm may have been leaking for several days or it may have been leaking six weeks before, when the patient had the symptoms he described on admission.

Dr. Roberg diagnosed this as an atherosclerotic aneurysm, because all other causes of the aneurysm could be excluded. The patient had no positive serology, and the aneurysm was in the abdominal portion of the aorta; syphilitic aneurysms more commonly are in the thoracic portion. There was no evidence that this was a mycotic, a traumatic or a false aneurysm, and in the sections there was no real cystic necrosis (idiopathic cystic necrosis of the media). The patient also had marked generalized arteriosclerosis in all other parts of the body.

DR. RADIN: I would like to ask Dr. Roberg what diagnostic procedures might be used in future cases of this sort, so that we would know not to use heparin for such patients.

DR. ROBERG: I think that the only diagnostic method here is *very* careful palpation of the abdominal aorta. This is practically the only way that this condition can be diagnosed. It would be very difficult to determine whether or not the heparin administered to this patient aggravated the bleeding. In most of these patients, rupture occurs and death follows rather promptly.

DR. E. O. WILLOUGHBY (assistant chief, medical service): What do you think of the procedure of injecting a small amount of dye into the aorta, possibly even on the operating room table, and then turning the problem over to the vascular surgeons?

DR. ROBERG: I think it is difficult to diagnose an aneurysm by injecting dye, because the degree of clot inside the aneurysm will tend to give the appearance of a normal lumen. I do not know whether or not extravasation of dye would be found in the retroperitoneum; I imagine that it would be. Certainly this often is true in the case of a ruptured kidney. I think, however, that the formation of a hematoma can be felt by abdominal examination

and palpation. The rupture almost invariably is to the left, because the aorta is on the left; the major deposition of the thrombus is on the anterolateral aspect. There is less thrombus when the aorta is against the lumbar spine; since it usually ruptures where there is not a thrombus, it tends to rupture near the lumbar spine and to leak retroperitoneally. As the hematoma develops, fullness usually can be felt; as it becomes larger there is transmitted pulsation to the firm mass in the flank. I think that the diagnosis rests chiefly on the physical examination.

DR. ROBERT LAPPE (resident, medical service): Do you think that a peritoneal tap might have helped?

DR. ROBERG: No. I think by the time an aneurysm ruptures through the peritoneum into the preperitoneal cavity, the patient usually is close to death. The most which would need to be done, perhaps, would be a retroperitoneal tap; however, this is not necessary because you usually can feel an increasing mass that is beginning to pulsate. Pulsation of the mass in the left flank can be felt by gentle and careful palpation.

MEETINGS *and Postgraduate Courses*

AMERICAN COLLEGE OF CHEST PHYSICIANS, WASHINGTON, D. C.: Interim session, November 26-28. For further information, write to: American College of Chest Physicians, 112 East Chestnut Street, Chicago 11.

SECOND INTERNATIONAL SYMPOSIUM ON CHEMOTHERAPY, NAPLES, ITALY: To be held September 14-17, 1961. For further information, write to: Professor P. Preziosi, Casella postale 266, Naples, Italy.

TEMPLE UNIVERSITY MEDICAL CENTER AND UNIVERSITY OF PENNSYLVANIA GRADUATE SCHOOL OF MEDICINE, PHILADELPHIA: Postgraduate course in allergy to be held at the Temple University Medical Center, February 27-March 10. For further information, write to: Dr. George Blumstein, Temple University Medical Center, Philadelphia 40.

TUFTS UNIVERSITY SCHOOL OF MEDICINE, BOSTON: Postgraduate courses for 1961:
- Hematology, March 23-25
- Electrocardiography 1, April 24-28
- Neurology, May 4-6

For further information, write to: Dr. Robert P. McCombs, Director, Postgraduate Division, Tufts University School of Medicine, 171 Harrison Avenue, Boston 11.

UNIVERSITY OF MINNESOTA, MINNEAPOLIS: Courses for the general practitioner to be presented at the Center for Continuation Study in 1961:
- Neurology, February 13-18
- Pediatrics, February 27-March 1
- Allergy, March 13-15
- Trauma, March 17-18
- Otolaryngology, April 20-22
- Gynecology, May 8-10
- Proctology, May 15-19
- Internal medicine, May 25-27
- Office psychotherapy, June 1-3
- Cancer detection, all year

For further information, write to: Director, Department of Continuation Medical Education, 1342 Mayo Memorial, University of Minnesota, Minneapolis 14.

UNIVERSITY OF MINNESOTA, MINNEAPOLIS: Courses for specialists to be presented at the Center for Continuation Study in 1961:
- Anesthesiology, February 6-8
- Surgery, February 9-11
- Neurology, February 13-18
- Pediatrics, February 27-March 1
- Allergy, March 13-15
- Urology, March 27-29
- Ophthalmology, May 1-3
- Internal medicine, May 25-27

For further information, write to: Director, Department of Continuation Medical Education, 1342 Mayo Memorial, University of Minnesota, Minneapolis 14.

THE UNIVERSITY OF TEXAS SOUTHWESTERN MEDICAL SCHOOL, DALLAS: Postgraduate courses for 1960-1961:
- Neurology, December 9-10, 1960
- Ophthalmology, January 6, 1961
- Psychiatry, January or February (to be announced)
- Pulmonary diseases (Mattson seminar), May or June (to be announced)

For further information, write to: Dr. John S. Chapman, Assistant Dean for Postgraduate Education, 5323 Harry Hines Boulevard, Dallas 35.

FIRST OF A SERIES

Art as a Function of Medical Education

HELMUTH NATHAN,* JOSEPH HIRSH† AND NESRIN BINGOL

Albert Einstein College of Medicine, New York

THE capacity to communicate is one of the cardinal characteristics which make man unique in the hierarchy of mammals. His ability to receive, understand, interpret and share hopes, ideals, ideas, facts, fantasies and fears is largely what makes him man. This ability is particularly important to the practicing physician. To be fully effective, he must know how to share, in simple, direct terms, his knowledge and skill with colleagues and students, with patients and their families. Early in his training the physician must come to realize that his knowledge is derived from many sources and disciplines outside of medicine. While the role of the physical and social sciences is understood and accepted, that of art, literature and philosophy is still not as well appreciated.

At the Albert Einstein College of Medicine in New York, which graduated its second class in May 1960, we have had an opportunity to demonstrate the utility of integrating art into the undergraduate medical curriculum and to lay the groundwork for a course in communications to test further the hypothesis that such instruction is central to the mandate of medicine.[1]

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In our increasingly overcrowded curriculum, it is still possible to integrate instruction on art and communications on an elective basis, and this is precisely what we have done. Despite the pressures of "required" course work, we have been pleasantly surprised and rewarded by the regular turnout (figure 1) of medical students in all four classes and of members of the house staff and faculty to the 17 scheduled lectures offered each year. The purposes of these basic lectures are: (1) to broaden physicians' horizons through an understanding of the history and psychology of art and of its interrelationship with medicine; (2) to demonstrate the dynamic characteristics of art as a form of communication which reflects normal and abnormal behavior and the particular qualities of various periods in human history; (3) through the artists' eyes to give physicians new insights and perspectives on how people look to each other in health and disease; and (4) to educate physicians through the incisive perceptions of the artists' views of their own illnesses (frontispiece*). These four goals have been achieved in various ways. The elective course directed by the senior author represents the foundation of our program. In addition to ourselves and other faculty members, a number of distinguished artists and critics have also participated, including sculptor Jacques Lipchitz (figure 2), the flamboyant Salvador Dali (figure 3), George Grosz (figure 4), José de Creeft, Professor Fritz Eichenberg and Professor Eugene Spiro.

The experience of lecturing to medical groups was as fascinating for the masters as for the students. The artists were impressed with the freedom and informality with which the students discussed their art. They accepted the students' criticism and listened to their judgments seriously. On their part, the students were happy to be confronted with people whose work and fame were known to them and to exchange ideas with them.

Intramurally the integration of art and medicine at our school takes place in anatomy classes which most readily lend themselves to this goal. To many purely scientifically oriented students it came as something of a surprise to learn that science is not limited to the scientist and that great painters and sculptors are keen observers and recorders. The contributions of such masters as Leonardo da Vinci and Michelangelo to the science of anatomy and their impact in broadening the cultural horizon of future physicians have been reaffirmed in many ways in the years since our students were initially exposed to this form of instruction.

*Albrecht Dürer, founder of the German renaissance movement in art, sent this sketch of himself to his physician along with a description of his symptoms of intermittent chills, high fever, severe malaise and swelling in his left side, from which the physician was able to make a diagnosis of malaria.

FIGURE 1. Jacques Lipchitz and Dr. Nathan in discussion with class.

FIGURE 2. Jacques Lipchitz discussing cubism and anatomy with the students.

FIGURE 3. Salvador Dali explains why the rhinoceros, with its horned nose, is "the most perfect anatomic construction of Nature, following the laws of Pythagoras."

FIGURE 4. George Grosz, a founder of the Dadaist movement and one of the leading philosophers among contemporary artists, defends the "new romanticism."

After basic grounding in the socioscientific significance of art, students were introduced to the special field of medical illustration as part of the series of 17 formal lectures. Such distinguished illustrators as Dr. Frank Netter, Felix Traugott and Albert Einstein College's medical artist, Stanley Waine, lectured on the history, development and utility of visual aids in medical teaching and medical scientific work. They demonstrated the stages in creating an illustration, from formulation of a need and conception of an idea to the printing of a multicolored picture or poster. A well-known movie producer, Paul Falkenberg, presented useful and informative material on the development, mechanics and methods of using scientific films.

One of the most consistent responses of students and faculty to the schedule of formal lectures has been the range and variety of imaginative suggestions. Some of these have already been implemented, such as the "Art of memory," discussed and demonstrated by Dr. Bruno Furst. The "Art and psychology of music," by Paul Emerich, and "The psychoanalytic view of art and jazz" are scheduled for the series. Students and faculty have responded with serious enthusiasm to the life art class which was supervised by a professional artist-teacher, Raphaelo Busoni. The improved drawing skills were immediately reflected in illustrations for clinical lectures and demonstrations.

A spontaneous outgrowth of the integration of art and medicine was the first faculty-staff-student art show early this year. The show was so successful it is to become an annual event. Practicing artists and critics served as judges and their stated interest was a tribute to the amateur artists' contributions. The show was open for two weeks to members of the college community and to the public, who found in it a new dimension to the college and to medicine.

The physician's professional duties and obligations follow him at all times, but the linking of art and science will always enlighten his work. Even in retirement, the doctor, who will have enjoyed the humanistic side of a wonderful profession, can look forward to continuous creative and receptive activity in the field of art.

REFERENCE

1. Hirsh, J.: Communication in medicine: A problem and a proposal. (In preparation.)

CLINICAL STUDY

Combined Meclizine and Nicotinic Acid in the Management of Certain Chronic Vascular Headaches

LESTER S. BLUMENTHAL AND MARVIN FUCHS*

George Washington University Hospital, Washington, D. C.

In a group of 134 cases of various types of headache, ANTIVERT® *(a combination of meclizine and nicotinic acid) was tried after other drugs had failed to produce satisfactory results.*

The study showed that Antivert has considerable value in the treatment and prevention of different kinds of vascular headache and also other symptoms associated with nasal congestion, nasal allergy, acute and chronic sinusitis, infection or polyps.

The authors emphasize that in treating headache, no one drug can be considered a cure-all or substitute for sound medical management, including supportive psychotherapy where indicated.

ELUCIDATION of the mechanism of head pain has accelerated progress in headache therapy in the last 20 years. The empiric method has given way to evaluation of pain-sensitive structures in the head and of the effects of vasoconstriction and vasodilatation. Study of the biochemical and enzymatic processes in mechanisms of allergic disorders will doubtlessly provide additional clinical benefits for headache patients in the years ahead.

Severe chronic headache is so common, so incapacitating and so wasteful that need for improved knowledge and therapeusis is hardly worth stressing. A few physicians who are still unwilling to cope with the problem of headache continue to ignore it and to encourage their patients to do the same. Immense suffering is consequently endured for many years by these patients. Although there is still considerable disagreement, general accord has been reached regarding the mechanism of action, classification and diagnosis of headaches. Since these aspects of the problem have been considered in other articles,[1-3] they will not be reviewed here. However, such knowledge and its utilization are requisite to the selection of specific agents in the over-all management in individual cases.

Meclizine dihydrochloride (p-chlorobenzylhydryl-4-m-methylbenzylpiperazine dihydrochloride) is a long-acting antihistaminic drug that has a low degree of toxicity and rarely produces side reactions. The efficacy of this drug in controlling motion sickness[4] and vertigo related to Ménière's syndrome and allied labyrinthine disorders[5] has been well established. Although the site and the mechanism of action of this drug in controlling vertigo, motion sickness, and nausea and vomiting due to various causes have not been clearly demonstrated, the peripheral labyrinthine structures appear to be the most likely site of its action.[6] Dolo-

*Headache Clinic, George Washington University Hospital, Washington, D. C.

LESTER S. BLUMENTHAL

MARVIN FUCHS

witz[7] has postulated that this action occurs in the labyrinthine nuclei rather than in the labyrinth itself.

Excellent reviews of the literature on the pathogenesis of motion sickness and on the pharmacology of drugs used in its treatment have been published by Chinn and Smith,[6] Tyler and Bard,[8] and De Wit.[9] Borison and Wang[10,11] have made outstanding reports on the pathogenesis of nausea and vomiting and on the pharmacology of drugs used in their treatment. Ample relationship exists between the mechanisms responsible for motion sickness and nausea and vomiting and those responsible for vascular headache.

Nicotinic acid, the antipellagra vitamin, has long been known as an excellent vasodilator. Studies on the action of this drug by Kety,[12] Scheinberg,[13] and other authors have revealed that the effect of this drug occurs principally by way of the extracranial branches of the external carotid artery, and that it produces an increase in blood flow only in derivatives of the external jugular vein. Studies on migraine as a prototype of vascular headache have indicated that it is chiefly an affliction of the extracranial blood vessels.[14]

It was not anticipated that Antivert (a combination of meclizine and nicotinic acid) would be effective in the treatment of migraine and ordinary tension headaches. The mechanism responsible for these types of headache is such that a combination of meclizine and nicotinic acid would not be expected to provide control. Conventional sedatives and combinations of ergot and other drugs are preferred for the palliation of acute headaches.

For a long time before our study was undertaken, we had been using nicotinic acid in the prophylactic treatment of vascular headache, but the results unfortunately had been inconclusive. We had been impressed by the effect of a combination of meclizine and nicotinic acid in preventing a variety of conditions that produce vertigo. We always have believed that this symptom is closely related to headache, especially in its mechanism of production. We, therefore, decided to study the effect of Antivert in a group of patients with headache due to a variety of causes.

Material and Method of Study

Our study is based on 134 cases of various types of headache observed during a period of 18 months. The patients were of various ages and of both sexes. A clinical history was elicited carefully, and the diagnosis was confirmed by physical examination and laboratory tests. This group did not include any case in which headache was only one of multiple primary symptoms.

The 134 cases were divided into five groups on the basis of the type of headache that was present (table 1). The relative number of cases in the different groups should not be considered an indication of the incidence of various types of headache since some selection of cases was made during the later stages of our study.

Group 1 includes 19 cases. In most of these cases, vascular headache was associated with nasal obstruction, nasal drainage or facial pain. This group also includes some cases of acute or chronic sinusitis, some cases of nasal allergy, and some cases in which headache and nasal congestion were clearly associated with acute or chronic sinusitis or nasal allergy.

Group 2 includes 29 cases of what we have designated as unclassified vascular headache. On the basis of its mechanism of action, the cranial pain in these cases could not be classified as migraine or as tension headache. Organic vascular disease, hypertension or arteriosclerosis was present in some of the cases in this group.

Group 3 includes 26 cases in which headache was associated with vertigo.

TABLE 1

TYPE OF HEADACHE AND RESULTS OF TREATMENT WITH ANTIVERT

GROUP	TYPE OF HEADACHE	CASES	RESULTS	
			Satisfactory	*Unsatisfactory*
1	Vascular headache associated with nasal obstruction, nasal drainage, nasal allergy, facial pain, sinusitis, etc.	19	16	3
2	Unclassified vascular headache	29	21	8
3	Headache associated with vertigo	26	*	*
4	Migraine	14	4	10
	Tension headache	40	12	28
5	Post-traumatic headache	6	5	1

*The results obtained in the 26 cases (group 3) in which headache was associated with vertigo are shown in table 2.

Group 4 includes 14 cases of migraine and 40 cases of tension headache. In all of the cases in this group, conventional therapy previously had produced only slight or moderate relief.

Group 5 includes six cases of post-traumatic headache, that is, cases in which headache occurred after a direct or indirect head injury.

The treatment was individualized to meet the needs of each patient. Although many different drugs were administered before and during the period of our study, Antivert was the chief new medicament that was tried after other drugs had failed to produce satisfactory results. The double-blind method of study was not deemed suitable because of the frequent subjective flushing caused by nicotinic acid.

One tablet of Antivert (12.5 mg. of meclizine and 50 mg. of nicotinic acid) usually was administered three or four times a day, but 8 to 12 tablets were administered daily in about 12 cases. In some of the cases, the drug had been administered for as long as 24 months when this paper was written.

Results

The results are shown in tables 1 and 2. The result was classified as satisfactory if there was a noteworthy reduction in the severity of the headache and if there was a concomitant decrease in the amount of the drug required to relieve the head pain. The result was classified as unsatisfactory if it did not fulfill these criteria.

Side Effects and Toxicity

No evidence of hypersensitivity or allergic reaction to the drug has been observed in any case. Although the drug was well tolerated, there was no evidence of an acquired tolerance for the drug. Habituation to the drug did not occur in any case.

Case Reports

Case 1—A 25 year old real estate salesman first consulted us because of headache. For the previous three weeks, he had awakened each morning with a heavy dull headache. The headache usually had lasted most of the day, but it occasionally had disappeared for several hours. He thought that he had felt better after he had got out of bed and had moved around. The history did not disclose any other symptoms. In 1956, he had received a medical discharge from the army because of a questionable diagnosis of chronic ulcerative colitis. Subsequent examination had revealed that he had an irritable bowel, but this had not caused him any further difficulty.

By talking to the patient it became evident that he had considerable nasal difficulty although he failed to recognize this himself. He

TABLE 2

RESULTS OF TREATMENT WITH ANTIVERT IN 26 CASES (GROUP 3) IN WHICH HEADACHE WAS ASSOCIATED WITH VERTIGO

RESULTS	CASES
Headache and vertigo improved	14
Headache unimproved; vertigo improved	9
Neither vertigo nor headache improved	3

talked with a definite nasal twang, and his nose seemed to be stuffed up continually. The only abnormality disclosed by complete physical examination was a round circular density, about 1.5 cm. in diameter, in the left maxillary sinus. This density probably represented a polyp.

At the time of the patient's first visit, a solution of PONTOCAINE® hydrochloride was applied to the sphenopalatine ganglions on both sides at the back of the nasal passages. The patient said that this relieved his headache immediately. When the patient was seen the next day, he said that his head was clearer than it had been for many years. He then realized that he had had a heavy, stuffy dizzy feeling in his head since his early teens, and that he never had known that this feeling was not normal. The relief produced by the treatment on the previous day startled the patient. The improvement persisted for several hours, but the headache and dizzy feeling recurred in the evening.

The patient was advised to take 1 tablet of Antivert 30 minutes before each meal and at bedtime. He has been observed at intervals since the administration of this drug was started. He says that a flushing reaction occurs occasionally when he takes the drug on an empty stomach. His head usually feels fine. He occasionally has a heavy feeling in his head when he arises in the morning, but this feeling disappears after he changes position and after the sinuses apparently drain.

On several occasions, he has stopped taking the Antivert, but the previous symptoms have recurred in a short time. Allergic tests have not been performed. The patient is so well satisfied with the relief that he has obtained with this treatment that he has decided to take Antivert regularly.

This case probably is an example of what Dr. Henry Williams of the Mayo Clinic used to describe as intrinsic allergy of the head. This condition is characterized by perennial vasomotor rhinitis, vertigo, headache and other manifestations of vasodilating headache, and Ménière's syndrome. This case also is an example of the action of Antivert in cases in which headache is associated with vertigo, stuffiness of the head, allergy or sinus disease.

Case 2—A 38 year old merchant was first observed in 1945 because of attacks of headache which recurred at irregular intervals. The attacks at first would occur following prolonged periods of extreme effort and fatigue and would be associated with an elevation of the blood pressure to 165 mm. of mercury systolic and 100 mm. diastolic. After sedation and complete rest, the blood pressure would return to approximately 135 mm. systolic and 90 mm. diastolic, and the severity of the headache would decrease. However, it would take about five to seven days for the attack to cease completely.

In 1950, he began to have attacks of vertigo associated with a stuffy, congested sensation in his ears. These attacks often would occur in conjunction with the attacks of headache. The attacks of vertigo have occurred on an average of two or three times a year without any demonstrable cause. On several occasions, intravenous injection of nicotinic acid would cause the vertigo and the associated symptoms to cease quite rapidly. He then would feel much better, but he would awaken the next morning with a heavy, dizzy feeling in his head, and the attack would not cease entirely for approximately one week.

The results of repeated physical examination were entirely normal except for recurrent mild psoriasis of the arms.

In July 1957, the administration of Antivert was started at the beginning of an attack. One tablet of the drug was administered four times a day. The patient obtained immediate relief. On the day after he started to take this drug, he was free of symptoms and remained so as long as he continued to take the drug. When

he discontinued taking the drug at the end of three days, mild symptoms recurred. He then continued to take the drug for another week, and the attack ceased completely.

In September 1957, he had another mild attack after a prolonged period of strenuous physical exertion and a long period of driving in his car. At that time, he was engaged in a new business venture. He then started to take one tablet of Antivert four times a day, and he obtained almost immediate relief. Since that time, he has carried this drug with him at all times, and he has started to take it at the slightest sign of any headache, dizziness, or other uncomfortable feeling in his head.

His response has been so satisfactory that he has regained all confidence in himself. In a recent interview, he told us that he now realizes that he did have a rather severe fear complex about becoming dizzy while driving a car or working. He had not mentioned this fear complex on previous occasions. This fear complex naturally could increase his anxiety and tension and could help to increase the severity of his attack. Since he knows that he has an available drug that will relieve him, he no longer has any reason to have this fear complex.

Thorough questioning has failed to reveal any evidence of allergy, sinusitis, nasal congestion or associated symptoms.

Case 3—A female switchboard operator, aged 44 years, consulted us in 1957 because of dizziness which had been present for two weeks and headache which had been present over the left eye and the left frontal area for four days. On one occasion during this illness she had felt as though she were going to faint, and she had had to hold onto a fence to keep from falling. Slight nausea had been present, and she had vomited occasionally. Administration of salicylates had not relieved the headache or dizziness.

Prior to the present illness, she had had recurrent attacks of headache for at least 20 years, and she had had dizziness off and on for three years. The attacks of headache had occurred approximately once a month and had been associated with her menstrual periods, which had ceased when a hysterectomy was performed for a fibroid uterus a year and a half before she consulted us. She has not had any menopausal symptoms since the hysterectomy was performed, and her gynecologist did not believe that her headache and vertigo were attributable to the menopause. He had prescribed several combinations of ergot and other drugs, but they had not relieved the headache.

She was advised to take 1 tablet of Antivert before meals and at bedtime. Her symptoms ceased several days later. The patient has continued to take this dose of Antivert. She has been seen on several occasions since her first visit. Complete medical examination, including a blood count, urinalysis, roentgenographic examination of the skull, electrocardiography, a histamine skin test and provocative tests, has not disclosed any abnormality.

She was last seen on October 30, 1957. At that time, she said that she had had several attacks of headache and vertigo which had responded quickly to administration of EDRISAL® with codeine. These attacks were not relieved by the previous administration of salicylates, sedatives or combinations of ergot and other drugs. She said that the feeling in her head was much clearer than it had been and that her balance was definitely better. She felt that a cloud had been lifted from her head.

Although it could not be proved that the headache in this case was of vascular origin, and although there was no evidence of nasal or sinus congestion, there was a combination of chronic headache and vertigo. We believe that Antivert has provided a considerable degree of relief, although the patient has continued to have an occasional severe attack that has required stronger medication. The patient's head has been clear between these attacks, and she has had much less trouble with vertigo.

Case 4—A 56 year old housewife consulted us in December 1956 because of headache which had been occurring for 20 years. During the previous five years, she had not gone through one entire day without having some headache, although the headache has ceased during certain periods of the day. Ergotamine was the only drug that had produced any re-

lief. She had taken 4 tablets of this drug at a time, and she had taken this dose once or twice a day.

The pain usually would begin over the left side of the vertex of the skull, and would feel as though someone were pulling four or five of her hairs. The pain would cause her to become nauseated and vomit. At times, she had been hospitalized for several days because of this vomiting. The pain was described as a throbbing, pulsating sensation. Her ears would feel as though they were throbbing and going in and out. Epistaxis often would occur after a severe headache. Before an attack of severe headache, she has noticed tinnitus, stuffiness of the ears, and a decrease in hearing. Her vision likewise has been affected, and marked photophobia has occurred.

Her last menstrual period occurred in 1952 but she still complained of severe flushes, numbness and tingling of her hands and feet, and the occasional occurrence of depression. A subcutaneous injection of histamine was administered two times a day for three weeks, but it did not have any noticeable effect on the flushing sensation or on the headache. Hormonal injections previously had relieved her flushes but had not had any effect on the headache. They did, however, produce an uncomfortable leukorrhea.

When the patient was a child, a window fell out of a house, and a pane of glass struck her on the head. She apparently did not lose consciousness. There was no family history of headache. Socially, the patient lived in her own house. She had been divorced for 10 years, and she had two grown children.

Physical examination revealed limited rotation of her neck to the left and tenderness of the right occipital nerve. The pulse rate was 80, the temperature was 97.8° F., and the blood pressure was 140 mm. of mercury systolic and 90 mm. diastolic.

The specific gravity of the urine was 1.003. Otherwise, the results of urinalysis were within normal limits. The erythrocyte count was 4,300,000 and the leukocyte count was 6500. Sixty-three per cent of the leukocytes were polymorphonuclear neutrophils and 36 per cent were lymphocytes. The value for the hemoglobin was 13.3 gm. per 100 cc. of blood. The sedimentation rate of the erythrocytes was 6 mm. in one hour, and the Wassermann reaction was negative. The value for the blood sugar was 101 mg. per 100 cc.; that for the blood cholesterol was 260 mg. per 100 cc.

Roentgenograms of the skull, cervical vertebrae, mastoid cells and chest were normal. Fluoroscopic examination of the gastrointestinal tract and proctoscopic examination to a height of 22 cm. did not disclose any abnormality. Pelvic smears did not reveal any evidence of cancer, but did disclose a slight estrogen deficiency. A histamine skin test was moderately positive, but a provocative test failed to produce headache.

Treatment included the administration of an antihistaminic drug and the use of a low-salt diet. The patient was advised to sleep in the head-up position. A combination of estrogen and testosterone was injected weekly or semiweekly, and ergotamine tablets were administered as necessary.

The response to this treatment was rather good, and the patient was observed at regular intervals. When the patient was seen in July 1957, she said that although her headaches were under partial control they still were occurring rather frequently, and that her hands still were falling asleep. She was advised to take 1 tablet of Antivert before each meal and at bedtime. One week later, she reported that she had had the worst week that she had had in eight months and that the headache had been present almost continuously. The administration of the Antivert was discontinued, and her condition improved. The administration of this drug has been resumed on two subsequent occasions, but on each of these occasions it has caused a flare-up of the headache.

The patient in this case has a combination of tension and vascular headache associated with endocrine imbalance. We are at a loss to know why Antivert should cause severe aggravation of the headache after injections of histamine did not do so. However, this patient has been treated with many different drugs, and she is able to evaluate the results of treatment quite well. She was most cooperative in trying the Antivert on three occasions.

Comment

Meclizine is noted for its low toxicity and lack of side effects. Our observations confirm the extraordinary safety of this drug. The well-known reactions (cutaneous flushing and sensations of warmth, tingling, itching, etc.) coincidental to the vasodilating properties of nicotinic acid may be used by the physician to point out to the patient that this component of Antivert is carrying out its function.

In the treatment of headache, as in the treatment of other disorders, no one drug can possibly be considered a cure-all or act as a substitute for sound medical management. In the treatment of chronic headache, supportive psychotherapy is required if anything more than random, sporadic relief of symptoms is desired. Appropriate measures must be taken to control sinus infection, allergy and other contributory factors.

Combinations of sedatives, analgesics and ergot are required for the treatment of acute attacks of migraine and tension headache. Although it was not anticipated that Antivert would prove effective in the treatment of these types of headache, satisfactory results were obtained in a small number of cases. In the cases of migraine in which the result was satisfactory, the headache was associated with vertigo, nasal obstruction or old age. In such cases, Antivert might be tried after other drugs have proved to be ineffective. In cases of typical vascular headache, such as migraine and histaminic cephalalgia, etc., the administration of Antivert may produce an increase in the severity of the headache. This response remains unexplained, but it may be similar to that of histamine or nitroglycerin.

The administration of Antivert produced satisfactory results in 21 of the 29 cases of unclassified vascular headache. In many of these cases, the patients were more than 40 years of age, and in some of the cases the patients were more than 60 years old. We interpret these results to indicate that the headache was closely related to organic vascular disease and that hypertension and arteriosclerosis were major contributing factors.

It is apparent that Antivert is of considerable value in preventing chronic vascular headache and other head symptoms associated with nasal congestion, nasal allergy, acute and chronic sinusitis, infection or polyps. This drug also provides noteworthy promise in the treatment of headache in geriatric patients and in the treatment of certain patients with post-traumatic headache. Headache associated with Ménière's syndrome or other types of vertigo often can be prevented by the regular administration of Antivert.

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CLINICAL STUDY

Experiences With a Hypocholesteremic Agent as a Dietary Supplement

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A concentrated preparation of polyunsaturated fatty acids administered as a dietary supplement to ambulatory patients was found to be an effective, practical adjunct in the management of hypercholesteremic patients with minimal dietary restriction. Twenty-four patients were given the preparation in 1 gm. capsules, 12 per day for 12 weeks. The cholesterol-lowering effect was greatest in persons whose initial blood cholesterol levels were highest.

IRVING HIRSHLEIFER

THE observed association of atherosclerosis and disturbed blood lipid levels is statistically significant. Many lipoprotein fractions have been measured, and each of them has advocates as to the intimacy of its relation to the factors predisposing to atherosclerosis. Despite the excellent and edifying investigations of these different lipid moieties, the serum cholesterol level remains as informative as data from the more elaborate procedures.[1,2] This fact and the indications of a causal relationship between diet, hypercholesteremia and atherosclerosis have led to many attempts to reduce the blood cholesterol level by dietary restriction.[3]

This study was undertaken to determine if elevated blood cholesterol levels could be lowered in ambulatory patients with minimal dietary restriction by the use of concentrated unsaturated fatty acids. There is a world of difference between a treatment which is feasible under institutional discipline and control and the care of the individual ambulatory patient.

Eight years ago, Kinsell[4] produced a fall in blood cholesterol levels with a diet rich in vegetable oil. Later, he and his co-workers[5] demonstrated an increased rate of formation of cholesterol and phospholipid when essential fatty acids were in short dietary supply. At the same time, Page and Brown[6] reported that vegetable oils in the diet were more effective in lowering lipid levels than were low-fat diets. Experiments with radioactive cholesterol in-

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dicate that the cholesterol which is removed from the blood when polyunsaturated fatty acids are added to the diet is actually excreted.[7]

Ahrens and associates,[8] testing a diet formulated with different types and amounts of fats, established a correlation between iodine number of the dietary fat and reduction of serum cholesterol. Kinsell and co-workers[9] interpreted their results as indicating that arachidonic acid (four double bonds) is eight times as potent as linoleic acid in lowering blood cholesterol levels. Worne and Smith[10] were able to demonstrate that with an increasing number of the double bonds of the fatty acids a smaller total amount of unsaturated fat is necessary to accomplish the desired reduction of cholesterol levels. This was followed by a report[11] showing that blood cholesterol values were lowered satisfactorily in 80 per cent of 50 patients with hypercholesteremia who received 4 gm. of polyunsaturated fatty acid complex (LENIC®,* 1 gm. capsules) daily for nine weeks. If the efficacy of unsaturated fats is assumed to be proportional to the degree of unsaturation or the number of chemical "double bonds," then this polyunsaturated fatty acid preparation is five to eight times as potent as an equivalent weight of the vegetable oils that have been used to reduce blood cholesterol.

Material and Method

Lenic capsules seemed to provide a stable concentrated form of unsaturated fatty acids to be tested as a dietary supplement. Lenic is a mixture of stabilized, highly unsaturated fatty acid glycerides prepared by low-temperature fractionation of fats and chromatographic separation technics. Each 1 gm. (16 minim) capsule contains tetraenoic (arachidonic), pentaenoic and hexaenoic acids, 100 mg.; linoleic acid, 495 mg.; oleic acid, 175 mg.; saturated fatty acids, 100 mg.; nonsaponifiables, 10 mg.

Four Lenic capsules were administered three times a day postprandially for 12 weeks to a series of 24 ambulatory patients (10 men and 14 women) ranging in age from 24 to 67 years; 19 were in the fifth and sixth decades of life.

Twenty of the 24 patients were hypercholesteremic. Their blood cholesterol levels had been followed for one month to five years prior to this study. All had been on rigid fat-restricted diets for periods ranging from one month to three years, but in no instance had the cholesterol level been more than 5 per cent below the value found at the start of this experiment; in most cases the level recorded at the initiation of the study was the lowest of the many recorded. The other four patients were considered to have normal cholesterol levels, a serum value of 250 mg. per hundred milliliters being taken as the arbitrary dividing line.

All the subjects were euthyroid as determined by clinical evaluation and protein-bound iodine determinations. The same laboratory was used for all the serum cholesterol measurements in each patient during the study period. Determinations were repeated at regular intervals of approximately two weeks.

All the patients had been on a rigidly restricted dietary regimen prior to the administration of Lenic. At the start of the experiment, however, they were allowed whole milk, boiled or poached eggs, all varieties of meat, fish and fowl (fat trimmed), and desserts in moderation (for example, less rich brands of ice cream).

In eight cases the diagnosis of arteriosclerosis or hypertensive heart disease, or both, had been made. Another three patients were diabetics. Nine of the 20 hypercholesteremic patients were members of four families with a history of familial hypercholesteremia.

Results

The serum cholesterol level in the 24 cases fell an average of 59 mg. per hundred milliliters, a 17 per cent drop from the initial levels (figure 1). In the 20 hypercholesteremic patients the fall averaged 77 mg. per hundred milliliters, or 21 per cent (figure 2). In the subjects whose starting levels were 250 mg. per hundred milliliters or less, the serum cho-

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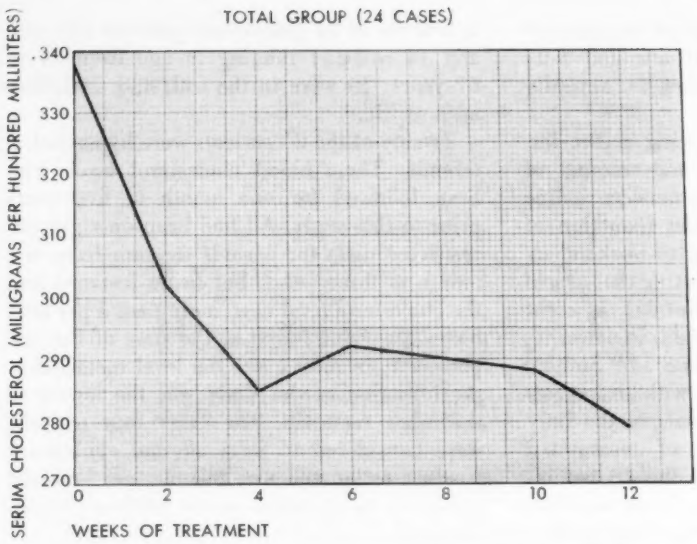

FIGURE 1. The average reduction in serum cholesterol for the total group of 24 patients who received 12 gm. of Lenic per day for 12 weeks was 59 mg. or 17 per cent.

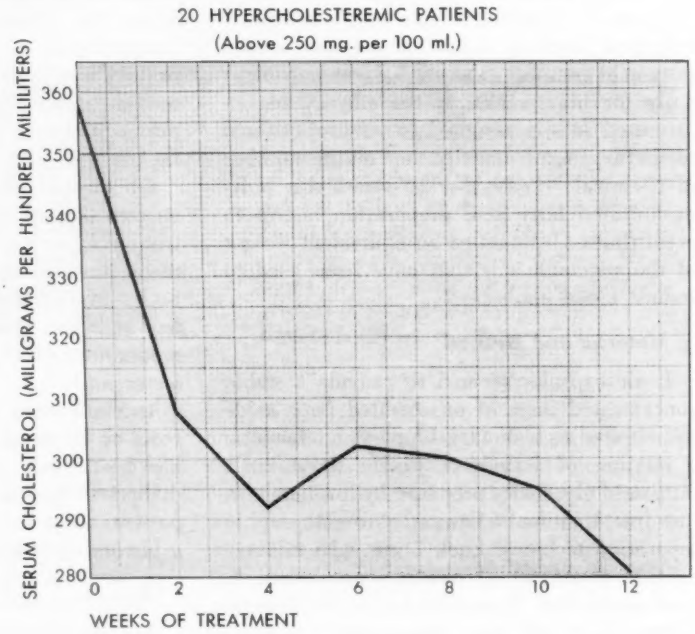

FIGURE 2. In the group of 20 patients with hypercholesteremia the fall in serum cholesterol averaged 77 mg. or 21 per cent.

lesterol rose an average of 30 mg. or 13 per cent (figure 3). In 11 of the hypercholesteremic patients, all with starting levels of 305 mg. per hundred milliliters or higher, the fall was most significant, averaging 33 per cent (figure 4). In all the latter cases the reduction of cholesterol was greater than 19 per cent (70 mg.).

Nineteen of the 20 hypercholesteremic patients had decreases in serum cholesterol levels. The one exception was a patient with a starting figure of 269 mg. per hundred mil-

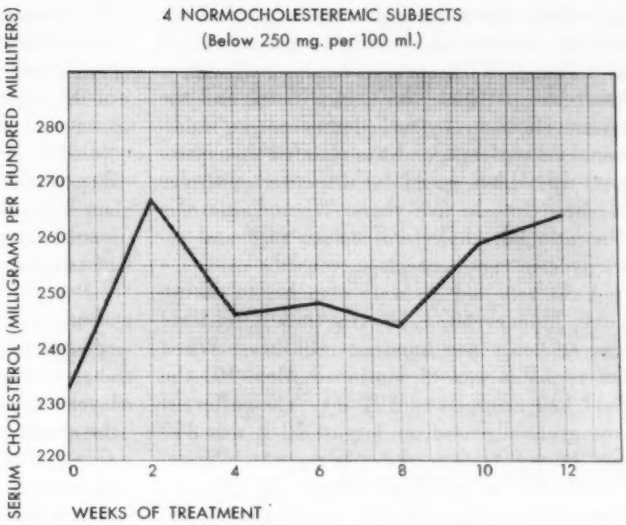

FIGURE 3. In the four subjects whose initial serum cholesterol levels were less than 250 mg. per hundred milliliters (normocholesteremic) there was an average rise of 30 mg. or 13 per cent.

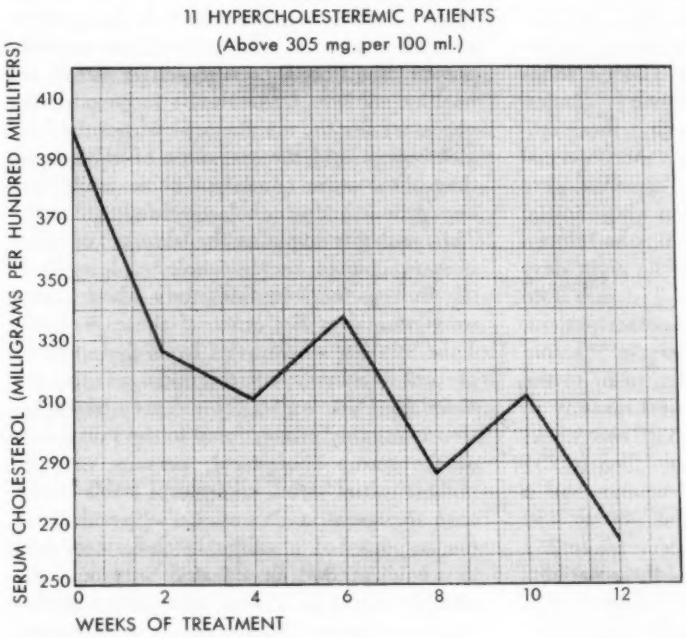

FIGURE 4. In 11 hypercholesteremic patients whose initial levels were 305 mg. or higher, the decrease in serum cholesterol averaged 33 per cent. In all these cases the reduction was greater than 19 per cent (70 mg.).

liliters, which rose 43 mg. or 16 per cent.

A 50 to 80 per cent clearing of xanthelasma was noted in three patients. In two of these, the fall in cholesterol levels was more than 20 per cent, but in the third, who demonstrated the greatest degree of clearing of xanthelasma, the cholesterol change was insignificant.

One woman with recalcitrant angina pectoris and severe hypercholesteremia started the Lenic regimen after following a rigidly restricted dietary regimen for one year, dur-

ing which time her weight was reduced 40 lb. and the cholesterol level decreased from 530 to 458 mg. While taking Lenic, and with a less restricted diet, she gained 5 lb. and the serum cholesterol level decreased an additional 22 per cent, and she claimed that nitroglycerin tablets could be dispensed with for the first time in five years. When Lenic was discontinued, cholesterol values rose and nitroglycerin requirements increased.

A 50 year old diabetic man began taking Lenic January 30, 1959. His cholesterol level was 420 mg. per hundred milliliters. When the regimen was discontinued May 10, the level had dropped to 197 mg. Thereafter, it rose gradually, and on August 13 it was 359 mg. Administration of Lenic capsules was resumed, but at a lower dosage (2 capsules three times a day). In two weeks the cholesterol level had fallen to 245 mg.

The effect of dietary indiscretion on cholesterol levels was dramatically shown in several patients who ate heavily of rich foods during holiday periods (Passover). Cholesterol values rose sharply following these episodes but dropped again when a more normal diet was resumed and Lenic capsules were continued. A 61 year old woman whose initial serum cholesterol level was 345 mg. had shown a drop to 288 mg. Midway in the eight days of Passover, her level rose to 370 mg. Two weeks later it fell to 300 mg. Another patient, a 51 year old woman, had a decrease in serum cholesterol from 359 to 251 mg. prior to the holiday, but the level rose to 300 midway in the eight day period and to 330 two weeks later; at the next reading it had fallen to 251 mg. Similarly, a 39 year old woman had a serum cholesterol increase from 360 to 450 mg. during the holiday, and a decrease to 232 mg. two weeks later. All three of these patients are housewives and exposed to multiple temptation in the kitchen. Presumably the overloading with saturated fat temporarily outweighed corrective effects resulting from the supplement of polyunsaturated fatty acids.

Discussion

More highly concentrated preparations of unsaturated fatty acids avoid the obesity problem presented by the ordinary high-caloric hypocholesteremic agent based on unsaturated fat. Treatment with Lenic at a dosage rate of 12 capsules per day adds 84 gm. of unsaturated fatty acid glyceride per week to the diet but contributes only 108 calories a day, or 756 a week. The daily elimination of one and one-half slices of bread from the diet would more than compensate for this small increase in calories.

Perkins and co-workers[12] tested emulsions of unsaturated fat on a series of healthy medical students and expressed the opinion that the observed slight decrease in serum cholesterol levels was not significant. The difference in the results of the study reported herein is probably due to the selection of hypercholesteremic subjects as the major group. The patients in the present study who had the highest initial cholesterol levels and strongest evidence of atherosclerotic stigmas showed the greatest hypocholesteremic effect. The atherosclerotic person handles fats differently from the healthy subject. Unsaturated fatty acids are necessary for the maintenance of normal lipid metabolism and the transport of cholesterol; they show more consistent cholesterol-lowering properties in cholesterol-fed animals.[13] This probably explains the absence of a significant change in the cholesterol levels of the four patients in this study whose values were normal at the onset of the experiment. This differing response of hypercholesteremic persons to a hypocholesteremic agent was also noted by Portman[14]: "The degree of depression is roughly proportional to the initial level of the serum cholesterol; persons with the highest initial serum cholesterol levels experience the greatest depression." Speculatively, the response of a subject's cholesterol level to a concentrated unsaturated fatty acid supplement might be a more informative method than an arbitrary determination of cholesterol level for classifying (or categorizing) those who are hypercholesteremic and those who are normocholesteremic.

In a study by Boyer and associates[15] the experimental diet supplied 5 per cent fewer calories as fat than did the pretreatment diet. Corn oil margarine containing 64 per cent

nonhydrogenated corn oil rich in linoleic acid was substituted for the ordinary solid fats of the diet, including those used in cooking. This regimen achieved and maintained a reduction in blood cholesterol levels of 300 institutionalized patients who were under rigid dietary control. It is doubtful, however, that any degree of education or warning will persuade the housewife with prized recipes, or restaurants that feature haute cuisine, to make this substitution.

Cigarette sales continue to increase despite the presentation in newspapers and lay periodicals of the most harrowing associations of tobacco and cancer. How can the man in the street be expected to demonstrate greater immunity to the more extensive and appealing food advertising than he has to the tobacco hucksters? The sale of filter cigarettes is apparently a reaction to cancer phobias. But effects are also exhaustible, so that the public rapidly becomes indifferent to the fears engendered by reports of associations between established customs and disease.

Although it is almost impossible to frighten people out of a vice, it is not nearly so difficult to get them to accept a means of therapy. Diets will continue to be selected with reference only to taste, abundance and standard of living, and fears will be translated into increased sales of anorectic and miracle nostrums. If understanding with its resultant anxieties could be directed toward the acceptance of a therapeutic counteracting modality, then one could have his cake and eat it. Unfortunately, people will not settle for less.

Summary and Conclusions

1. Twenty-four ambulatory patients in office practice were given 12 1 gm. capsules daily of a concentrated form of highly unsaturated fatty acids (Lenic) as a dietary supplement for a period of 12 weeks.

2. The hypocholesteremic effect of this dietary supplement was related to the height of the starting serum cholesterol level. It was greatest in patients with the highest initial levels, and least in those considered to be normocholesteremic. The latter patients actually demonstrated increased cholesterol values while they were taking this medication.

3. Lenic, a highly concentrated preparation of polyunsaturated fatty acids, was found to be an effective, acceptable hypocholesteremic agent with practical utilization as an adjunct to the management of hypercholesteremic patients whose dietary restrictions were minimal.

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Editorials

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PSYCHOSOMATICS: A CHALLENGE IN MODERN MEDICINE

WHATEVER their individual theories, the pioneer investigators who correlated situational and personality factors with the symptoms of psychosomatic disease concurred in assuming that in time, all illness would be regarded as psychosomatic. That time is now upon us. As physicians, whatever our specialty, we recognize a responsibility for treating the "whole person" when he presents his symptoms for amelioration. Although the psychosomatic orientation promotes the effectiveness and permanence of medical effort, it also increases the complexity of the diagnostic and therapeutic job a thousandfold. Through specialization and teamwork, we achieve maximum application of advance medical knowledge. Through consultation and sharing of information, we conserve time.

But there is a glaring fault in the system. Somebody, somewhere along the line, has to get to know the patient. We may know him medically, organ by organ, and the physiologic interactions thereof—but who got his side of the story? Where, in this battery of experts, is the family doctor and fellow citizen, the man who by virtue of shared community life has developed an empathy for the patient's frame of reference, who is aware of the milieu of individual burdens, rewards, and situational and individual conflicts he experiences? Nowhere. We have found the "whole person" medically and psychiatrically; yet somehow he continues to elude us in common-sense, social terms.

In recognition of this handicap to the effective practice of modern medicine, a series of articles specific to the management of psychosomatic problems is scheduled to appear in POSTGRADUATE MEDICINE within the next few months.

Introducing the series in this issue* is an excellent, practical list of rules for effective personal interviewing, developed by Drs. Francis H. Hoffman and William A. Steiger. Don't expect any easy, "pat" questions, though,

*Page 315.

except one—the ever-effective word "Why?" Expect, instead, an education in attitude.

The role of the nonpsychiatric specialist in the recognition and management of emotional problems, with comforting focus on what he does not need to be in order to discharge his responsibilities effectively, is discussed by Dr. Albert C. Sherwin. Again, here, the theme is attitude-selective attention, mature good judgment, and intuitive diagnostics.

A significant article by Dr. Leo Alexander will discuss psychotherapy in general practice, a subject which concerns us all because this is a type of treatment we administer involuntarily. Psychotherapy is an intrinsic part of the doctor-patient relationship; it is a variable which cannot and should not be eliminated in the medical setting. As such, it requires control and focus for maximum benefit to the patient.

Following these general commentaries, we hope to present a variety of discussions dealing with the more frequent types of interpersonal turmoil, trouble and tension which contribute to the exacerbation of psychosomatic symptoms, as well as to more subtle effects such as increased accident vulnerability, decreased resistance to infection, and delayed recovery from organic illness. Marriage problems, adolescent adjustment strain, conflict of religious and social group identifications, financial and social goal threats are prominent foci of conflict for the neurotic and the immature patient. At this time, we are preparing for publication an outstanding discussion of interaction problems in marriage by Dr. N. Q. Brill. Plans for the series are not yet complete. Suggestions and comments from readers about major areas of interest will be appreciated.

FRANKLIN G. EBAUGH

MEDICAL LIBRARIES AND MEDICAL DOCUMENTATION

THE Rockefeller Foundation has made a grant of $1,500,000 to the Harvard Medical Center, Boston, to endow a medical library that will serve the needs of the Harvard Medical Center and the medical schools of the Boston and Tufts universities. Cooperating in planning and financing the central medical library are the Harvard Medical School, Massachusetts General Hospital, Peter Bent Brigham Hospital, Beth Israel Hospital, Boston Lying-in Hospital, Children's Hospital, Free Hospital for Women, and the Massachusetts Eye and Ear Infirmary. This statement may provoke thoughts on monopoly and the perils of bigness. Actually the project can only result in advancement of bibliographic study, economic functioning, and better utilization of reference services.

The central medical library will maintain an efficient catalog. Facilities will be developed for rapid distribution of requested material from the central library to the cooperating institutions. Each of these will have its own working library containing the most frequently used current medical periodicals and reference works. The central library will house all items of historical interest. The Boston project may well lead to surveys in other cities, for example, Chicago, where competition among many libraries leads to duplication, wastefulness and unnecessary difficulty in medical bibliography.

A vast increase in information and in the sources of bibliographic research has accompanied medical and scientific advances. Great medical libraries like the National Medical Library in Bethesda and the medical library of Moscow receive some 5000 periodicals and large numbers of books, pamphlets, monographs and reprints. Indexing this material is a costly and complex procedure, and abstracting has become a major industry. Research is now being undertaken to adapt machine methods to indexing and to recover material from multiple sources when it is needed.

Another Rockefeller Foundation grant provides three study and travel awards in medical librarianship to foreign members of the Medical Library Association, Inc. The program requires that grantees return to their native countries to work for at least two years after their training period. So far 28 librarians have received fellowships under this program.

In the new offices of *Excerpta Medica* in

Amsterdam, the title of the journal and the name of each author together with the bibliographic reference are photographed on a card as soon as a periodical is received. Subsequently the complete article may be microfilmed on cards for future reference. In my investigation of medical documentation in the United States, Great Britain, Holland, Poland and Russia, I found nothing anywhere else to equal the procedure in handling masses of medical material that I saw in Holland.

The *Abstracts of Soviet Medicine,* published by Excerpta Medica Foundation, have opened a vast source of information to the English-reading world. Some 600 periodicals are published in the U. S. S. R. In 1961, no doubt, *Abstracts of Japanese Medicine,* reflecting some 700 Japanese publications, similarly will be made available. The Chinese literature will continue to be obscure to the world for some time because of difficulty of access to publications in the Chinese language. Just available from Warsaw is a publication in English, French and German, reflecting Polish progress in internal medicine.

The Medicine From Abroad department in POSTGRADUATE MEDICINE has been gradually broadened to include current information from most of the large nations of the world and some of the smaller ones. Interest in international accomplishments in medical science should show to all the world how much is to be gained by unrestricted exchange of information for the good of the health of all peoples.

MORRIS FISHBEIN

LIVE VIRUS VACCINES IN POLIOMYELITIS

DR. Hilary Koprowski,[1] director of the Wistar Institute of Anatomy and Biology, Philadelphia, who delivered the 1959 Alvarenga Prize Lecture of the College of Physicians of Philadelphia, chose for his subject "Historical aspects of the development of live virus vaccines in poliomyelitis." Early in his discussion he recounted the first experiment in which live, attenuated poliomyelitis virus was orally administered to a six year old boy; this was done on February 27, 1950. Later, virus of the same strain was given to another nonimmune subject and subsequently to 18 children. In January 1951, an evaluation indicated the procedure was harmless. Attenuation is defined as loss of pathogenicity for man but retention of all antigenic qualities for immunization purposes.

With a profound knowledge of mythology, Dr. Koprowski's record of the history of the development of live virus vaccines purported to "dispel certain myths and make sure that the legends and parables surrounding these myths are not substituted for history." The mythological analogies add spice to the narrative, but the reader will detect an undercurrent of bitterness. This was indeed expressed when Dr. Koprowski said, "Those of you who know your mythology probably remember that in spite of solemn promises Heracles received no reward for his labor. Augeas even denied that he and Heracles had struck a bargain. Familiarity with the story of live virus vaccine against polio makes one sometimes wonder if one is dealing with a *historical* myth only." And again, "My associates and I were alone in this field when the work began and remained so for several years."

The contributions of Dr. Koprowski and his associates are epochal and include many firsts, for which they have received inadequate recognition. They attenuated the virus by numerous passages in laboratory rodents and administered the vaccine orally to human beings. They prepared mixtures of Type I and Type II viruses. When tissue culture systems became available through the work of Enders, Weller and Robbins, they adapted their studies to the use of these technics and immunized two children against Type I virus and one child with a mixture of two attenuated viruses. "Thus, a new principle was established, indicating the possibility of immunization by oral feeding of a combination of two or more strains of polio administered simultaneously."

Since these fundamental studies were completed and reported, many other investigators

have contributed to this field. In 1954, Li and Schaeffer adapted Mahoney Type I strain of poliomyelitis virus to laboratory mice. The resulting variant was then passed through monkey testis culture and monkey skin, and the resultant virus, which was of low pathogenicity for primates, was made available to Dr. Sabin. According to Dr. Koprowski, Dr. Sabin is using it today as a Type I vaccine.

Dr. Koprowski traced meticulously the expanding studies which have enabled scientists to mark the attenuated viruses. He believes that the existence of these markers may finally lead to true mutation through chemical change of the infectious nucleic acid. As a culmination, Dr. Koprowski said, "There is great attraction in the thought that perhaps the newborn population is the ideal population to receive live virus and that too little emphasis has been placed on the host, who in the end reacts to the virus infection." Immunity following administration of live virus is undoubtedly of long duration; some of the children in the original experiment have shown antibodies eight to nine years later.

Vast clinical trials have been made with orally administered poliomyelitis vaccines, including those on more than 300,000 children in the Belgian Congo, on some 10 million children and adolescents now being vaccinated in Poland, and on many millions in Russia. Other trials are under way in Sweden, Switzerland, Mexico and several countries of South America.

Abstracts of the papers presented to the Fifth International Poliomyelitis Conference in Copenhagen,[2] July 26 to 28, 1960, are available and indicate that differences of opinion and arguments still pervade the scene. A purified poliomyelitis vaccine of killed virus has been prepared which apparently requires but two doses given one month apart. Concentration of the antigen permits reduction of the dose volume, and detectable monkey kidney antigen is eliminated.

Extensive experience with the live, attenuated poliomyelitis virus vaccine was reported from many countries. Professor Chumakov, Moscow, argued for the attenuated virus vaccine, claiming that 15 million had been vaccinated by the end of 1959 and that he proposes to vaccinate 75 million more in 1960. More than 104 million doses have been distributed from Moscow. Dr. A. A. Smorodintsev said that live poliomyelitis virus vaccine in the variant produced from attenuated Sabin strains is completely harmless and presents no danger of reversion and transition by the vaccinal strains to a more virulent state. Dr. M. Voroshilova, Institute for Poliomyelitis Research, Moscow, reported that antibody response after taking live, attenuated virus vaccine was adequate and boosted the antibody total even when it was given after inoculation with the Salk killed virus vaccine. The consensus seemed to be that live, attenuated poliomyelitis virus vaccine is easy to administer, inexpensive and harmless.

Some uncertainty remains as to the genetic stability of live poliomyelitis virus vaccine. Dr. J. Melnick, Baylor University, said, "Do these changes in the in vitro markers and the associated increase in monkey neurovirulence have any significance as regards the use of these vaccines in man? The question is probably of greater importance for the contacts than for the vaccinees." V. D. Soloviev, Moscow, said, "The stability of the secondary passages of the vaccine strains should be taken into consideration when there are contacts with nonvaccinated groups because, for them, people vaccinated with the live vaccine can be the source of infection."

MORRIS FISHBEIN

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THE BROWN PHYSIOGNOMY

For many centuries fashion has made fools of the female sex. In the Middle Ages men wore tight breeches, ruffs about the neck, lace cuffs, and other peacockish adornments, but they have reformed. The massive powdered wigs of that era remain only in the official

wigs used in British legal procedure. Now American enterprise has contributed to the peculiarities of masculine adornment solutions to be placed on the skin which will provide those who use them with the outward appearance associated with long hours on the beach, pleasant exposure on the golf course, and, essentially, the appearance of the well-heeled man of leisure.

Solutions which produce a tanning of the skin apparently identical with that produced by sunlight are a new drugstore commodity. They make the skin dark, but not in the same way that sunlight does. The chemical involved is dihydroxyacetone. A British dermatologist concocted a mixture of this ingredient with glycerin, alcohol and water. After this was painted on the skin, a light brown appearance developed in 6 to 10 hours. If hourly reapplications were made, the color deepened. The color could not be removed by cleansing agents, fat solvents or mechanical superficial abrasion, but, in any event, it gradually disappeared in five to eight days.

In an experiment, this solution was applied to the skin of 32 normals and 10 eczematous patients. Neither irritations nor discomfort ensued. Use of the preparation did not diminish the response of the skin to ultraviolet rays. The skin burned just as if it had not been colored by the use of the dihydroxyacetone.

The obviously desirable cosmetic usage of such a substance is in cases of vitiligo. A number of patients with this condition were treated with dihydroxyacetone and the areas of leukoderma developed reactions similar to those of the unaffected skin. However, it was exceedingly difficult to match the color of the vitiliginous area with that of the surrounding skin. Unless the painting of the unpigmented skin was done carefully, the skin on the periphery of the light area became too darkly colored. Dr. P. B. Mumford,[1] Manchester, England, who made these studies, suggests modification of the original solution with a cream and an added tracer color, washable after an hour, which might thus yield an even color of the area concerned.

Cosmetics come and cosmetics go as fashions change. The fingernails vary from deep crimson to platinum, and the damsel who does not comply somehow seems peculiar. The decorated has become the normal. The hair of the ladies in Paris is at the moment, or anyway it was a month ago, built into a beehive of a uniform gray. Last year the usual color was streaked with gray. The royal jelly of the queen bee has been proved by laborious scientific controlled studies to be without any real cosmetic merit. The changing appearance of femininity is a constant source of surprise and perhaps of amazement and dismay.

MORRIS FISHBEIN

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AUSTRALIA

Placenta previa—L. Woodrow Cox, University of Adelaide Faculty of Medicine, has stated that placenta previa can be diagnosed in about 16 per cent of cases before hemorrhage occurs by noting persistent malpresentations and by roentgenographic examination of the placenta.

When placenta previa is diagnosed, the patient should be hospitalized and treated until the thirty-seventh week. The hemoglobin level should be determined frequently, as slight hemorrhages may cause an unexpectedly low level and corrective transfusions may be necessary. This therapy will decrease the effect of a major hemorrhage on fetal oxygenation. Cesarean section should be carried out immediately if extensive bleeding occurs before the thirty-seventh week.

Cesarean section also should be performed on patients with placenta previa centralis at the thirty-seventh week. Patients with noncentral placenta previa may be allowed to start labor spontaneously; slight bleeding can be controlled, and delivery can be hastened by rupturing the membranes during labor.

Bretylium tosylate—Bretylium tosylate, an agent which produces hypotension in humans without any evidence of parasympathetic blocking, has been discussed by Drs. J. G. Hayden and W. C. Boake, University of Melbourne Faculty of Medicine. The drug was administered to 12 men and four women, half of whom had not responded to other ganglion-blocking agents. Five patients were well stabilized on 200 to 400 mg. bretylium tosylate three times a day. One patient required 800 mg. four times a day, together with chlorothiazide. In contrast, there was only a slight fall in blood pressure in two patients who received 600 mg. four times a day. Tolerance to the drug occurred in two patients. In two patients with renal disease, the dosage of bretylium tosylate required to produce a satisfactory response caused an increase in the level of urea in the blood which persisted until the drug was withdrawn.

While taking this drug, one patient complained of nasal obstruction, which was rapidly relieved by inhalation of amphetamine; one patient had diarrhea and flushing of the skin, and three patients had pain in the region of one or both

(Continued on page A-137)

parotid glands. No depression or other symptoms which would suggest that the drug affected the central nervous system were observed.

The authors' observations confirmed that bretylium tosylate is a hypotensive agent which selectively blocks adrenergic nerves. In dosages of 600 to 3200 mg. per day, it has few inherent side effects and does not block parasympathetic pathways or depress the central nervous system. The action of the drug is potentiated by use of chlorothiazide.

Testing for serum sensitivity—Allergic reactions to antiserums have been reported since the introduction of diphtheria antitoxin in 1891. The incidence of the acute anaphylactic-type reaction has not been affected appreciably by modern processing.

Dr. John C. Trinca, Commonwealth Serum Laboratories, Melbourne, has described some experiences with the intradermal method of testing for sensitivity. He also has presented the results of a clinical trial, initiated in Melbourne, in which a modification of the subcutaneous trial-dose method was used.

Dr. Trinca advocates the following procedures: active immunization of the entire population, exercising particular caution in immunizing asthmatic persons; use of the subcutaneous trial-dose method with diluted serum in testing for sensitivity; and observation of the patient for at least 30 minutes after any injection of tetanus antitoxin. He also emphasizes that syringes used for administering antitoxin should not be used for other injectable substances. He believes that since there is no urgency in carrying out passive immunization with tetanus antitoxin, screening tests for sensitivity may be deferred to a time that is convenient for both the doctor and patient.

These reports are based on articles which have appeared in the *Medical Journal of Australia.*

AUSTRIA

Lipogranulomatosis—At a meeting of the Viennese Pediatric Society, F. C. Havranek reported on a three month old girl in whom solid cutaneous nodes had developed at seven weeks of age. The nodes were movable, tablet-shaped and the size of a dime; they were located over the sternum, on the back, and on the right elbow. The child's history showed that delivery had been difficult, with a breech presentation. Her birth weight was 3,350 gm. Postnatal development was good. Internal examination revealed no abnormality; however, exposure to the slightest cold produced cutis marmorata. Laboratory findings were within the normal ranges, with the exception of an increased sedimentation rate, eosinophilia, and a slight elevation in the level of cholesterol in the blood. During the observation period, the cutaneous nodes gradually disappeared without producing discoloration or any change in the cutaneous surface.

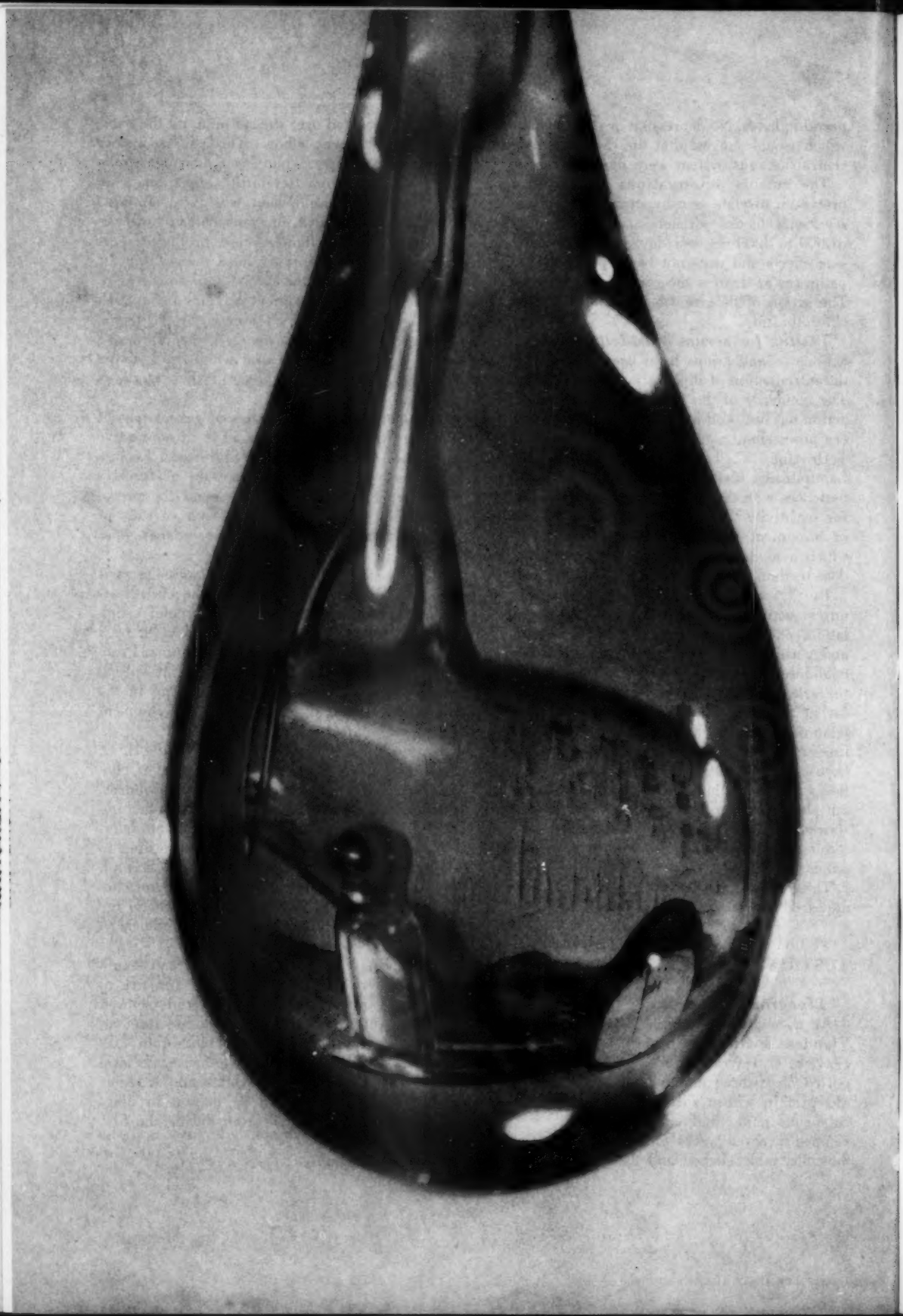
Histologic examination showed granulomas of the fatty tissue, with proliferation of connective tissue and an infiltration of fibroblasts. Eosinophils and giant cells characteristic of foreign-body granulomas were seen around the necrobiotic foci in the subcutis. Acicular crystals of fatty acid, arranged radially or in bundles, were detected in the tissue.

The disease process resembled adiponecrosis neonatorum, but the severity of the cutis marmorata and the localization of the chief symptoms suggested that the nodes were caused by a vascular condition rather than by trauma. Probably, multiple stimuli, together with the special chemical constitution of the fat existing in the subcutis of the newborn, led to the development of lipogranulomatosis.

Determination of cholinesterase—H. O. Stur has reported on the determination of cholinesterase in the blood serum of 207 newborns, of whom 21 were premature. Blood from the umbilical cord was used in the test, and the determination was made with Acholest, according to the method of Sailer, Braunsteiner and Stumpf. It was found that reduced values of serum cholinesterase occurred in about 10 per cent of the children and that these values were not influenced by the birth weight.

The levels of serum cholinesterase and serum bilirubin were observed during the first five to six days of life in 24 children. The study showed that as a rule the serum cholinesterase level remained constant, regardless of the serum bilirubin level. Since the serum cholinesterase level is not affected by icterus neonatorum, it seems that this procedure would be helpful in diagnosing lesions of the liver even during the first days of life.

(Continued on page A-140)



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BRAZIL

Prolapse of the uterus and cancer—In *Anais brasileiros de ginecologia,* A. A. Quinet and S. Rotstein have discussed the relationship of prolapse of the uterus to cervical carcinoma. These two conditions are rarely associated, and many authors have stated that prolapse might inhibit development of carcinoma.

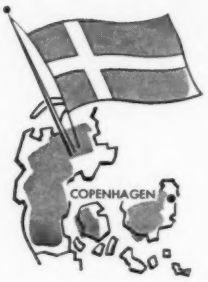
Quinet and Rotstein reviewed a series of 157 patients, including some nulliparas, who had different stages of prolapse. The incidence of prolapse associated with cancer of the cervix was 0.05 to 1.0 per cent. There is no standard method of treating patients in whom both conditions are present, and the prognosis is not encouraging.

Tumors of the nasal cavity—O. Peres and A. A. R. Guimarães have stated in *Revista brasileira de cirurgia* that radium therapy is the treatment of choice for tumors of limited size located in the nasal cavity. When larger lesions are present, radium therapy is used in combination with surgery and chemotherapy. The following forms of radiation therapy may be used: Curie therapy, including radium implantation; roentgen therapy, both static and convergent kinetic; and telecurie therapy, including the use of teleradium and telecobalt. Selection of the therapeutic method depends on the site of the tumor and on its extension.

Atrioventricularis communis—J. Hortêncio Medeiros, L. G. d'Oliveira, M. V. Martin, A. J. H. Nicolai and A. Barbosa Lima have presented two cases in which atrioventricularis communis was associated with other congenital anomalies. In the first case, the associated anomalies were aortic coarctation and patent ductus arteriosus, distal to the site of the coarctation; in the second they were hypoplasia of the right ventricle and arch of the aorta and patent ductus arteriosus connecting the left subclavian artery.

The authors also considered the development of the endocardial cushions in the atrioventricular canal and atrial and ventricular septal malformations. The latter include atrioventricularis communis, persistent ostium primum with a cleft mitral valve, and defects of the membranous portion of the ventricular septum with a cleft tricuspid valve.

DENMARK



Bretylium tosylate—In *Ugeskrift for laeger,* Drs. E. Clausen, T. Hilden and A. R. Krogsgaard have reported that bretylium tosylate (Darenthin) is an antihypertensive agent which does not affect the parasympathetic nervous system and does not cause the side effects characteristic of ganglion-blocking agents. These findings agree with those reported in the letter from Australia (page A-134). Clausen and co-workers also found that the drug's hypotensive effect is predominantly orthostatic and somewhat inconstant; tolerance to it may develop following prolonged treatment. A pronounced fall in blood pressure associated with quite severe and characteristic symptoms occurred in some patients undertaking physical activity and necessitated withdrawal of the drug in some cases.

Composition of sweat—The sodium-potassium ratio in the thermal sweat of nine children with pancreatic fibrosis has been investigated by Palle Grønbæk. Sweat was collected in a rubber glove or an arm bag for 45 minutes at a room temperature of 30° C. The opposite hand and forearm were placed in a water bath held at a constant temperature of 45° C. The values obtained were significantly higher than those for the control group of 35 girls and 31 boys.

Grønbæk also investigated 18 patients with endocrine disorders and three with renal diseases. Only one patient, a 14 day old infant with congenital hyperplasia of the adrenal cortex, had an elevated sodium-potassium ratio.

Petit mal-grand mal stimulation—Following the use of petit mal-grand mal stimulation (curare and electrostimulation without medically induced anesthesia) in 52 psychiatric patients, Bent Møller-Christensen has concluded that this method cannot be recommended for routine use. However, it may be indicated if very large quantities of barbiturates are necessary to produce anesthesia or if the patient is sensitive to barbiturates. The method seems to be contraindicated in hypertensive patients. Theoretically, it would appear to aid psychiatric patients with reduced pulmonary function, if the somatic condition does not contraindicate electrostimulation.

(Continued on page A-143)

ENGLAND

Management of bacterial endocarditis—The introduction of antibiotics has dramatically changed the prognosis of bacterial endocarditis. However, although antibiotics control the infection in 90 to 95 per cent of patients, there is still a mortality of up to 30 per cent. Acute endocarditis may occur with any septicemia and attack a previously normal heart. The subacute variety, however, nearly always involves a previously damaged heart. In a discussion at the Royal Society of Medicine, Dr. J. F. Goodwin, Postgraduate Medical School, Hammersmith Hospital, London, pointed out that infection usually follows minor surgery, especially dental extraction. Bacterial endocarditis may follow urologic procedures such as cystoscopy or prostatectomy, or it may occur after childbirth. Much can be done to prevent the infection if antibiotic prophylaxis is given for dental extractions in patients with a known cardiac lesion. After the extraction of a tooth, bacteria from the socket (usually *Streptococcus viridans*) are liberated into the blood stream and may settle in an already abnormal heart.

It is vitally important that patients with heart disease should have their teeth well cared for and that a patient who has had bacterial endocarditis should have all carious or damaged teeth removed under full antibiotic cover. In a series of 39 cases of bacterial endocarditis from Hammersmith Hospital, tooth extraction could be blamed in nine and antibiotic cover was probably inadequate in three. Antibiotic cover should consist of 600,000 to 1 million units of penicillin injected daily for two days before, during, and two days after the extraction. Cystoscopy and prostatectomy should be covered routinely by chemotherapy, and childbirth in patients with known cardiac disease always should be covered by penicillin.

The antibiotic to be used depends on the infecting organism and its sensitivity and, to some extent, on the accessibility of the lesion. Penicillin may be used as the sole antibiotic only if the organism is highly sensitive, such as *Str. viridans*. Penicillin alone should be continued only if there is immediate and full response to treatment and if no relapse occurs. Usually it is unwise to administer a single antibiotic for long periods. Penicillin plus streptomycin is most effective for treating infectious endocarditis. This combination should be used if the organism is a less sensitive *Str. viridans* and when positive blood cultures have not been obtained.

Medical Research Council's annual report—The annual report of the Medical Research Council indicates that the Council believes that the time has come to establish a Clinical Research Center "comprising a comprehensive concentration of relevant clinical and paraclinical disciplines," which would be the equivalent in the clinical field of the National Institute for Medical Research at Mill Hill. This would allow for the planning of collaborative work, which is impossible under the present system of establishing research units in individual hospitals or university departments. It is proposed to house the new Clinical Research Center in an existing general hospital.

During the financial year covered by the report, Parliament provided the Council with just under £3.5 million (about $10 million), an increase of about £400,000 over the previous year. Establishments supported included the National Institute for Medical Research, the M.R.C. Laboratories in Gambia (West Africa), and 71 research units. The Council also assisted numerous individuals as members of its external staff with grants and training awards, and provided block grants for research programs in many individual hospitals and institutes. The Public Health Laboratory Service and the Blood Products Laboratory (Lister Institute) also were administered by the M.R.C. on behalf of the Ministry of Health.

A progress report on interferon, the antiviral agent which was discovered three years ago by workers at the National Institute for Medical Research, also was included. Toxicity studies in animals have been encouraging, and, although the substance is a protein, the search for antigenicity has been negative. One important practical point is that a certain tissue specificity necessitates that interferon be prepared in cells of the species of animal it is intended to protect. Its action appears to be on infected cells, possibly by shifting the metabolism of substances like glucose away from the virus and toward the cell. Since interferon protects against a variety of viruses, it is hoped that technical problems in production soon will be overcome.

(Continued on page A-144)

FRANCE

Death from coronary diseases—In *Bulletins et mémoires de la Société médicale des hôpitaux de Paris,* Professors Jean Lenegre and Jean Humbert have reported the results of a study of the causes of death in 212 patients with coronary lesions. The study covered the period from 1949 to 1956; it included 174 men and 38 women whose ages ranged from 25 to 77 years, the average being 60 years. Arteriosclerosis alone was found in 96 patients; it was associated with arterial hypertension in 103 patients and with primary valvular lesions in 13. Three-fourths of the patients had angina pectoris, and the majority had multiple lesions. Stenosis was observed in 180 patients, and signs of infarction were present in 163 patients, 35 of whom had double lesions.

Of the patients who survived the initial heart attack, 75 per cent lived more than one year; 34 per cent more than five years; 11 per cent more than 10 years; 3 per cent more than 15 years; and 1 per cent more than 20 years. The average survival time was 4 11/12 years, which approximates the published survival periods of 3 5/12 years for patients with infarction and 4 1/12 years for patients with angina pectoris.

One-third of the patients died as a result of irreducible heart failure; in 67 patients this was aggravated by pulmonary embolism. Seventy-eight patients had fatal infarctions. Two-thirds of the remaining patients had peripheral arteritis, and the rest died of various causes. Thirty patients died suddenly.

Heart failure was observed in three-fourths of the patients and was of a serious nature in 102 patients. It was caused by infarction in 36 patients, but in 66 patients it occurred spontaneously and preceded the first paroxysm of angina pectoris. The length of survival ranged from 4 to 14 years.

Twenty-three of the patients with infarction were ambulatory at the time of death. Acute heart failure and different mechanisms, including heart rupture and irreversible ventricular tachycardia, caused the death of about one-half of the patients. Complications such as pulmonary embolism, arteritis of the sylvian and renal arteries, aortic rupture and obliterating atherosclerosis of the peripheral vessels, particularly in hypertensive patients, proved fatal in 37 patients.

ISRAEL

Diabetes mellitus—A. M. Cohen, Hadassah University Hospital, Jerusalem, has reported in *Harefuah* on the incidence of diabetes mellitus in Jews of the Kurdish and Yemenite communities in Israel. Although diabetes is strongly hereditary in character, its development depends on a variety of precipitating factors connected with environment. In Yemen and Kurdistan, the Jews lived under primitive conditions; when they immigrated to Israel, they came into contact with the Western way of life for the first time.

The incidence of diabetes among persons who had lived in Israel for 10 years or less was compared with that among members of the same communities who either were born in Israel or had lived there for more than 25 years. Among the Yemenites, diabetes was present in 0.06 per cent of 4,906 recent immigrants and in 2.9 per cent of 751 native-born and long-term residents. There were no cases of diabetes in 988 Kurdish immigrants, while an incidence of 2 per cent was observed among 598 Kurds who had lived in Israel for many years.

Splenic portography in echinococcosis of the liver—Splenic portography may be helpful in diagnosing hydatid disease when clinical and laboratory findings are equivocal. In the *Israel Medical Journal,* T. Wiznitzer and A. Schwartz, Hadassah University Hospital, Jerusalem, have discussed the use of this procedure in several patients.

One of the patients discussed had pain in the upper right side of the abdomen and hepatosplenomegaly. Results of the Casoni test were positive, while those of the Weinberg test were negative. There was 5 per cent eosinophilia. A roentgenogram of the hepatic region did not show any calcification, but the right side of the diaphragm was markedly elevated. A splenic portogram revealed a large avascular area below the right side of the diaphragm. At operation a

(Continued on page A-146)

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TRIAMINIC®	50 mg.
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Each tsp. (5 ml.) of Tussagesic Suspension provides:

TRIAMINIC®	25 mg.
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Tussagesic Suspension is especially suited for children and for adults who prefer liquid medication; it is pleasantly flavored, non-narcotic and non-alcoholic.

Dosage (to be taken every 3 or 4 hours): *Adults and children over 12* – 1 or 2 tsp.; *Children 6 to 12* – 1 tsp.; *Children 1 to 6* – ½ tsp.; *Children under 1* – ¼ tsp.

* TRADEMARK

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large hydatid was found in the part of the liver corresponding to the avascular region seen on the x-ray. In two other cases in which the findings were equivocal, a splenic portogram showed the presence of avascular areas, and cysts were found at operation.

Splenic portography is also useful in excluding echinococcosis. This diagnosis was suspected in a patient who had chronic pain in the hepatic region, 8 per cent eosinophilia, and a positive reaction to the Weinberg test. The splenic portogram gave normal findings, and a hepatic lesion was not found at operation.

JAPAN

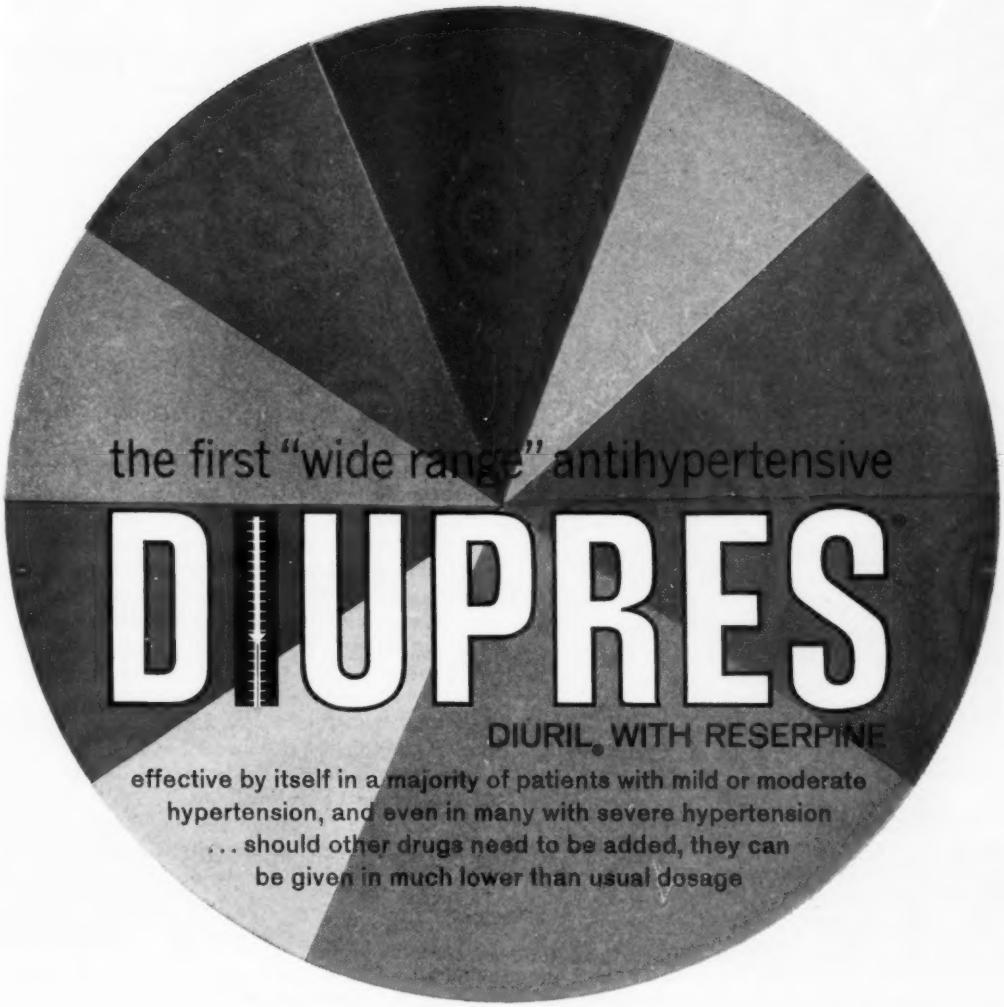
Primary aldosteronism—Since the first case of primary aldosteronism was reported by Conn in 1955, approximately 40 cases have been discussed in the world literature. The second case, reported in the *Japanese Archives of Internal Medicine*, concerned a 27 year old man with recurring attacks of muscle weakness, paralysis and tetany due to hypokaliemia and alkalosis, hypernatremia, polyuria and polydipsia, and hypertension of two years' duration. The specific gravity and the concentrating ability of the urine were lowered and did not improve with administration of vasopressin. The rate of renal clearance was slightly disturbed, and histamine-fast anacidity was present. The endocrine organs were functioning normally except for the adrenal glands. Urinary excretion of aldosterone was 40 μg. per day during the early stage of the disease, while that of 17-hydroxycorticosterone and 17-ketosteroids was normal. The level of plasma 17-hydroxycorticosterone was slightly lowered. Administration of ACTH resulted in normal excretion of 17-hydroxycorticosterone and 17-ketosteroids and in the number of eosinophils, with a slight degree of sodium diuresis.

Following the restriction of sodium intake, the level of serum sodium was markedly decreased, as were hypertension, urinary volume and excretion of aldosterone. This decrease was unaffected when the sodium intake was increased. Retroperitoneal pneumography, particularly tomograms, demonstrated an adrenal tumor on the left side which was removed surgically along with the adrenal gland, and was found to be a benign adenoma. Compensatory atrophy was noted in the cells of the zona glomerulosa.

After the tumor was removed, the patient showed rapid improvement in all symptoms, including achylia gastrica. However, the renal concentrating ability and clearance rate remained impaired. Five months postoperatively the patient was quite well with no signs of relapse.

Osteochondrosis cervicalis—In *Archiv für japanische Chirurgie*, Dr. K. Ando has summarized results of a study of 54 patients with osteochondrosis cervicalis begun in 1947 and conducted by the department of orthopedic surgery, Kyoto Imperial University Faculty of Medicine. There were 48 men and six women, ranging in age from 27 to 65 years old. Forty-three (79 per cent) of the 54 patients were more than 50 years old. Forty patients had cervical disk protrusion and 14 patients had cervical spondylosis. The majority had initial symptoms of numbness in the fingers, clumsiness of the hands, and spastic weakness in the legs. On admission to the hospital, 27 patients had quadriparesis, and walking was difficult or impossible. Seven patients had sensory paresis of all extremities with motor disturbances in the legs, and were unable to wash their faces because of severe motor disturbances in the upper extremities. Only two patients complained of severe pain. Myelograms, using 3 ml. of Moljodol or Myelopaque and routinely made of the anteroposterior view with the patient prone, revealed passage disturbances in all patients with complete block in three. The distance between the level of protrusion and the base of the U-shaped shadows corresponded to the height of one or two vertebral bodies in most cases, but to four vertebral bodies in some. Anteroposterior views with the patient in the lateral position and lateral views with the patient in the prone position were recommended to obtain clear-cut views of the nerve root sac and to observe the front contour of the dural sac.

Operation was performed to relieve spinal cord compression due to disk protrusions or ridges, and the results were classified as excellent (completely cured) in two patients, good (no difficulty in social life) in 20, fair in nine and unsatisfactory in 10. The condition was aggravated in four patients, eight died, and one was lost to follow-up. Of the eight fatalities, four occurred within 3 to 15 days postoperatively, and the others within two to three and one-half years.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Information published in this department is supplied by the manufacturers of the products described.

• **REG-U-TEMP SITZ BATH**

DESCRIPTION: Weighing 2 lb., this portable pan-shaped unit has a wide flange which allows it to fit in any toilet bowl, thus enabling the patient to immerse only the perineal, genital and rectal areas while in a normal sitting position. A hose and connection for any nearby faucet and a valve which diverts water into the bath or the toilet bowl allow the patient to control the water temperature without moving. The unit cannot overflow or back-siphon, and it meets all standard plumbing codes. Made of high-impact polyproylene, this bath can be autoclaved or washed with alcohol or any common cleaning compound. Optional accessories include an oversized tub and faucet adapter, a 10 ft. extension hose, and a water mixer for separate hot and cold water taps.
PRODUCER: Harlan M. Buck, Inc., Rye, N. Y.

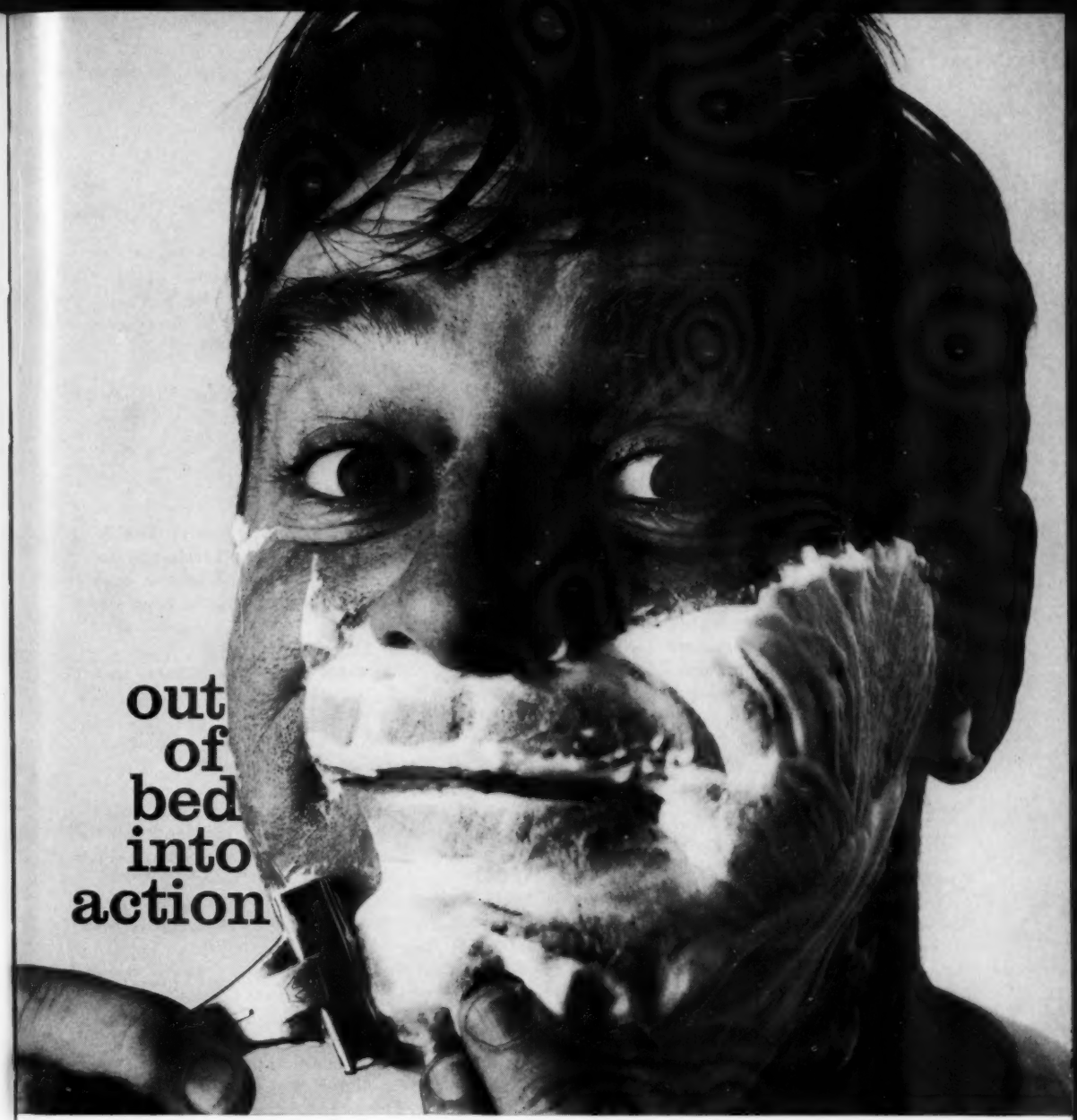
• **DESBUTAL® GRADUMET®**

PURPOSE: Control of obesity and management of psychosomatic complaints.
COMPOSITION: Desbutal 10 Gradumet: 10 mg. methamphetamine hydrochloride (DESOXYN®) and 60 mg. pentobarbital sodium (NEMBUTAL®). Desbutal 15 Gradumet: 15 mg. Desoxyn and 90 mg. Nembutal.
CAUTION: Nervousness or excessive sedation may occur but can usually be controlled by reducing the dosage. The drug should be used with caution in patients with hypertension or other cardiovascular disease. It is generally contraindicated in patients with hyperthyroidism or a known sensitivity to ephedrine or its derivatives.
DOSAGE AND ADMINISTRATION: 1 tablet taken during or immediately after breakfast. If an anorexigenic effect is desired, tablet should be taken 30 to 60 minutes before breakfast.
HOW SUPPLIED: Bottles of 100 and 500.
PRODUCER: Abbott Laboratories, North Chicago.

• **ULCETROL**

PURPOSE: Nutritional supplement and antacid therapy for ulcer patients.
COMPOSITION: Each tablet contains four antacids and eight vitamins.
DOSAGE: 2 tablets taken two hours after each meal and whenever symptoms occur.
HOW SUPPLIED: Boxes of 100.
PRODUCER: Flint-Eaton Division, Decatur, Ill., a subsidiary of Baxter Laboratories, Inc., Morton Grove, Ill.

(Continued on page A-164)



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• QUADRUPLE BLOOD-PACK® UNIT (Model JD-4)

DESCRIPTION: Developed for pediatric use, this sterile, pyrogen-free system for subdividing collected blood into amounts of 50 ml. to 150 ml. provides up to four transfusions from 1 pt. of blood. The system consists of a 500 ml. primary pack connected by closed-system tubing to three 150 ml. transfer packs. An interlock needle cover is provided for maintaining sterility of the blood-repellent, laminar-flow phlebotomy needle. The primary pack contains 75 ml. of A.C.D. solution, U.S.P. formula A. All units, including the donor tube and the intrapack tubes, are identically numbered for maximal safety. Each subunit can be used safely up to 21 days after collection.
PRODUCER: Fenwal Laboratories, Framingham, Mass.

• NEOPAN® CREAM

PURPOSE: Antibiotic and antipruritic therapy.
COMPOSITION: Each gram contains 5 mg. neomycin sulfate (0.5 per cent), equivalent to 3.5 mg. neomycin base, and 20 mg. pantothenylol (2 per cent) in a water-miscible cream base.
DOSAGE AND ADMINISTRATION: Apply once or twice daily or more often if needed.
HOW SUPPLIED: 2 oz. and 1 lb. jars.
PRODUCER: U. S. Vitamin & Pharmaceutical Corp., New York.

CORRECTION

LIPITEST® Reagent (Schain), which appeared on page A-102 of the August issue, is produced by the Distributive Products Department, Chemical Division, Merck & Co., Inc., Rahway, N. J., not by Merck Sharp & Dohme, Division of Merck & Co., Inc., Philadelphia, as was given.

• TABLOID®

PURPOSE: To treat schistosomiasis.
COMPOSITION: Each tablet contains 200 mg. lucanthone hydrochloride.
CAUTION: Administer with caution to patients with renal or severe hepatic damage.
DOSAGE AND ADMINISTRATION: 15 mg. per kilogram of body weight, divided into three doses per day for seven consecutive days.
HOW SUPPLIED: Bottles of 30.
PRODUCER: Burroughs Wellcome & Co. (U. S. A.) Inc., Tuckahoe, N. Y.

• CUPERTIN CREAM

PURPOSE: To treat mycotic infections of the skin.
COMPOSITION: 2 per cent diphenylpyraline hydrochloride in a nonstaining, water-washable base.
DOSAGE AND ADMINISTRATION: Apply topically once or twice daily.
HOW SUPPLIED: 15 gm. tubes.
PRODUCER: Cooper, Tinsley Laboratories, Inc., Harrison, N. J.

• SERUMS FOR COOMBS' ANTIGLOBULIN TEST

DESCRIPTION: Designed to give more precise information in the identification of blood factor antibodies, these three serums introduce a new concept in use of the Coombs antiglobulin test.
Anti-Gamma-Globulin Serum (rabbit) is specific for the gamma-globulin fraction of human serum. It reacts best with cells coated with any of the Rh antibodies and is particularly useful in D^u (Rh_o variant) testing. It also is helpful in detecting anti-K and anti-Fy^a antibodies.
Anti-Non-Gamma-Globulin Serum (goat) reacts with cells coated with a nongamma-globulin antibody and is helpful in studying antibodies occurring in ABO hemolytic disease, as well as anti-Le^a, anti-Le^b, anti-JKa, and some examples of anti-K and anti-Fy^a antibodies.
Anti-Gamma Plus Non-Gamma-Globulin Serum (goat) has maximal reactivity for both gamma antibodies and nongamma antibodies and is recommended for use in all Coombs' tests.
HOW SUPPLIED: 2 cc. and 5 cc. dropper vials.
PRODUCER: Hyland Laboratories, Los Angeles, a subsidiary of Baxter Laboratories, Inc., Morton Grove, Ill.

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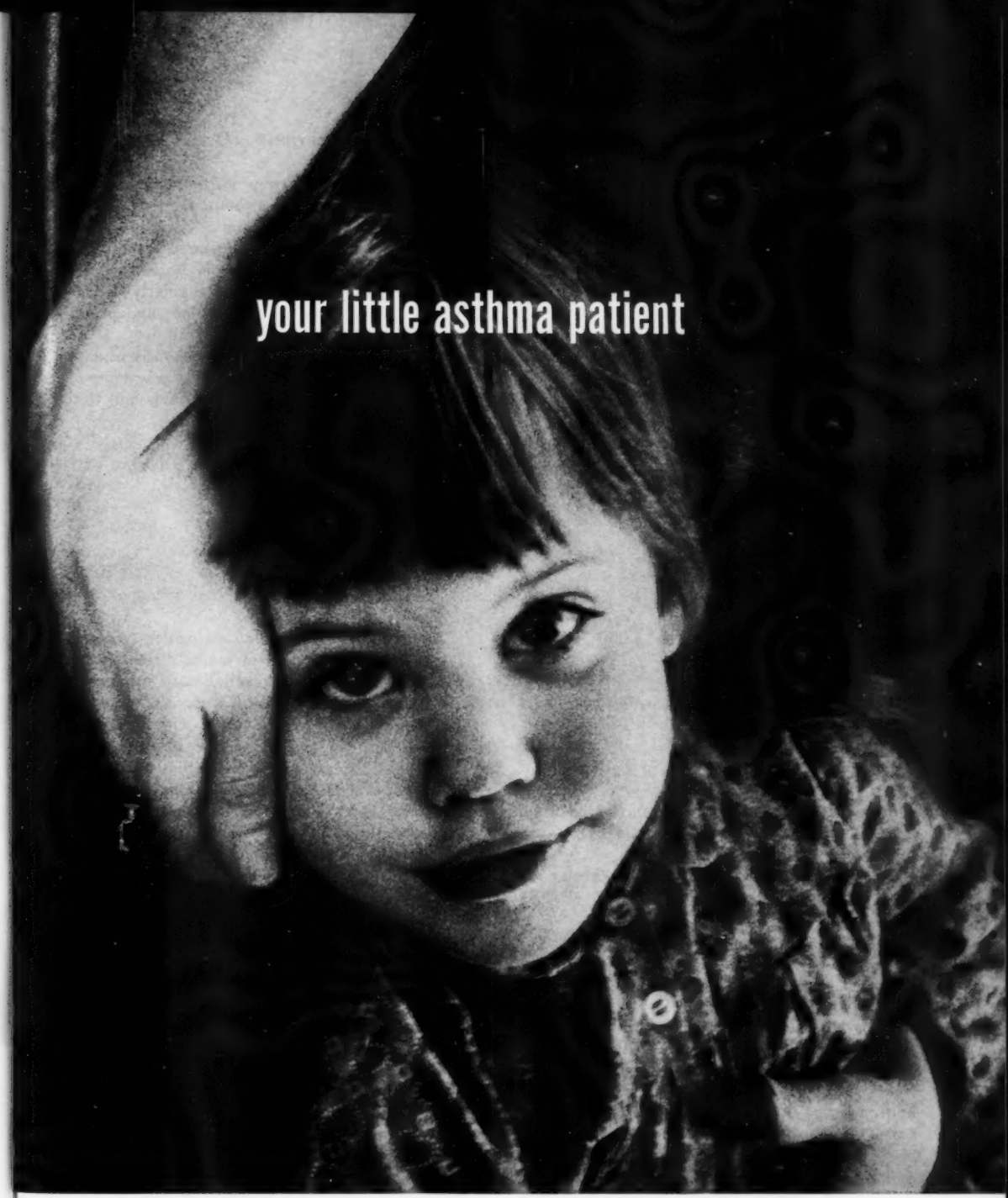

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you can provide it with a single, convenient tablet of NEPHENALIN® PEDIATRIC. Placed under the tongue, NEPHENALIN PEDIATRIC releases isoproterenol HCl, 5 mg., potent epinephrine homologue, to open the airway with utmost speed. Swallowed, the small square red tablet gives the child sustained asthma relief with the well-known, reliable combination of theophylline (1½ gr.), ephedrine (3/16 gr.) and phenobarbital (⅛ gr.). NEPHENALIN PEDIATRIC is available for your prescription in bottles of 20 and 100 tablets. Also available: NEPHENALIN (for adults).

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Nephenalin®

PEDIATRIC

• CHAIR-MODE

DESCRIPTION: Designed for use with either the conventional bedpan or the standard commode pail, this bedside commode is concealed underneath the chair cushion. The hinged toilet seat permits easy removal or replacement of the receptacle. Upholstered in cloth-supported plastic which is easily cleaned, the chair is available in tan, coral or white.
PRODUCER: Duxe Products, Cincinnati.

• RIOPAN

PURPOSE: Antacid therapy.
COMPOSITION: Each tablet and each teaspoonful of suspension contains 400 mg. hydrated magnesium aluminate (monalium hydrate).
DOSAGE AND ADMINISTRATION: 1 or 2 tablets swallowed with water or 1 or 2 teaspoonfuls suspension, preferably between meals and at bedtime.
HOW SUPPLIED: Tablets in packages of 60 and 500; suspension in 12 fl. oz. bottles.
PRODUCER: Ayerst Laboratories, New York.

•LIPALONE CREAMS

PURPOSE: Antiinflammatory, antibacterial and antipruritic therapy.
COMPOSITION: Lipalone Cream contains 0.25 per cent prednisolone and 0.5 per cent hexachlorophene. Iodo-Lipalone Cream contains 0.25 per cent prednisolone and 3 per cent iodochlorhydroxyquin.
CAUTION: These creams are for external application only. Iodo-Lipalone Cream may stain fabric or hair.
DOSAGE AND ADMINISTRATION: Rub into affected area two to four times daily as directed.
HOW SUPPLIED: 5 gm., ½ oz. and 1 oz. tubes and 1 lb. jars.
PRODUCER: Spirt & Co., Inc., Waterbury, Conn.

• INJECTION AQUAMEPHYTON®

PURPOSE: To correct hypoprothrombinemia.
COMPOSITION: 10 mg. of vitamin K_1 per cubic centimeter in a colloidal solution.
CAUTION: In anticoagulant-induced hypoprothrombinemia, low dosages should be used and the prothrombin time checked regularly. The drug should be stored in a cool place and protected from light.
DOSAGE AND ADMINISTRATION: Intravenously when bleeding has begun or is threatened; subcutaneously or intramuscularly for prophylaxis and to control low prothrombin levels.
HOW SUPPLIED: 1 cc. vials.
PRODUCER: Merck Sharp & Dohme, Division of Merck & Co., Inc., West Point, Pa.

• FEMOGEN TABLETS

PURPOSE: To treat menstrual and menopausal disorders.
COMPOSITION: Water-soluble conjugated estrogens prepared from pregnant mares' urine.
CAUTION: This agent is contraindicated in treatment of endometriosis. Large doses are contraindicated when rhythmic function with fertility is desirable. Many physicians also believe that estrogens should not be used in patients who have a familial or personal history of malignancy.
DOSAGE AND ADMINISTRATION: For severe menopausal symptoms, 1.25 mg. daily. If a satisfactory response is not obtained after four or five days, the dosage should be increased to 2.5 or 3.75 mg. daily.
HOW SUPPLIED: 0.625 or 1.25 mg. tablets in bottles of 100 and 1000.
PRODUCER: Testagar & Co., Inc., Detroit.

• MYSTECLIN®-F CAPSULES
(New Product Form)

PURPOSE: Antibacterial therapy and prevention of moniliasis.
COMPOSITION: Each capsule contains 250 mg. tetracycline hydrochloride and 50 mg. amphotericin B (FUNGIZONE®).
HOW SUPPLIED: Bottles of 16 and 100. Half-strength capsules in bottles of 16.
PRODUCER: E. R. Squibb & Sons, Division of Olin Mathieson Chemical Corporation, New York.

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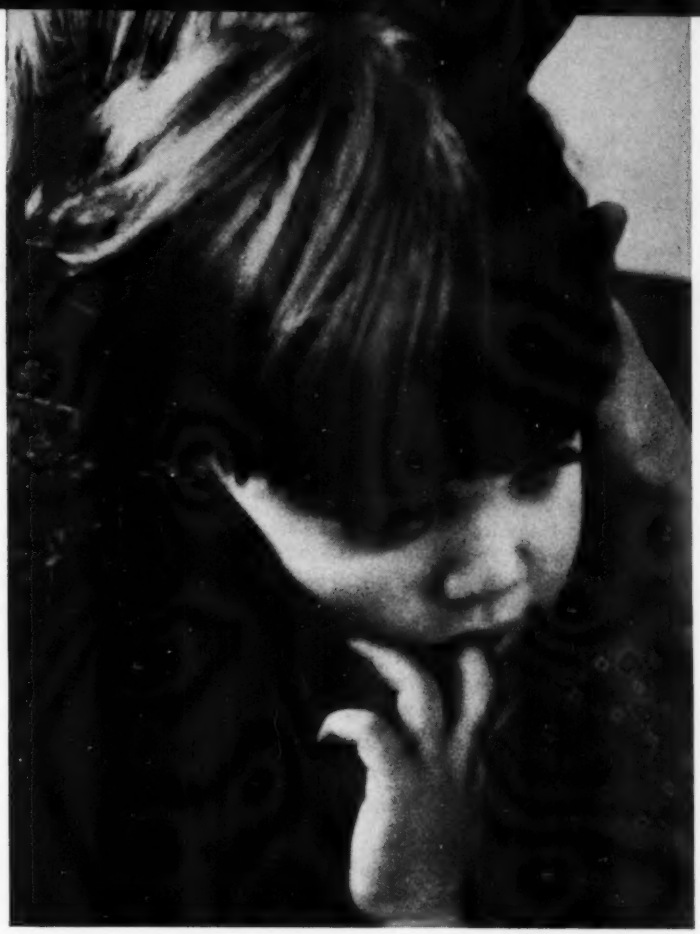

Effective against more than 30 of the commonly encountered pathogens, including **staph** and **strep,** Panalba KM assures you of prompt control in potentially-serious pediatric infections. Panalba KM makes a pleasant-tasting, readily accepted suspension.

When sufficient water is added to fill the bottle to a total volume of 40 cc. (or 60 cc.) and the contents shaken, each 5 cc. (one teaspoonful) contains:

Panmycin (tetracycline) equivalent to tetracycline hydrochloride..... 125 mg.
Albamycin (as novobiocin calcium) 62.5 mg.
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Supplied: In 40 cc. and 60 cc. bottles.

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Panalba KM *Granules

PANMYCIN* PLUS ALBAMYCIN* WITH POTASSIUM METAPHOSPHATE (KM)

your broad-spectrum antibiotic of **first** resort

• IDENTIFICATION TAG FOR DIABETICS

DESCRIPTION: Embossed with a large letter "D," this circular identification tag identifies its wearer as a diabetic. The opposite side of the tag contains printed instructions for immediate treatment in case of unconsciousness. Made of anodized aluminum and measuring 1 in. in diameter, the tag can be worn as a necklace or as a bracelet without danger of marking skin or clothing. It is lightweight and will not bend or break.
PRODUCER: Aluminum Company of America, Pittsburgh.

• HUMIJET

DESCRIPTION: Attached by a built-in clamp to the boom of all electric oxygen tents, this device provides an air-oxygen fog circulating pattern which moves 8 cu. ft. of air per minute without draft. Supersaturated humidity at a controlled temperature is attained with either a high or low concentration of oxygen. The unit can be autoclaved and will not rust. All metal parts are made of stainless steel, chrome-plated brass or anodized aluminum. The instrument operates with either an oxygen regulator or a flowmeter, and is available with a glass or plastic reservoir bottle.
PRODUCER: Medical Equipment Division of Melchior, Armstrong, Dessau Inc., Ridgefield, N. J.

• DIANEAL

DESCRIPTION: Used in peritoneal dialysis, this solution is supplied in two forms which are identical in electrolyte composition but have different dextrose concentrations. The 1.5 per cent dextrose solution is indicated in acute renal failure; the 7 per cent solution is used to remove fluid in the presence of massive edema.
PRODUCER: Baxter Laboratories, Inc., Morton Grove, Ill.

• STRIATRAN

PURPOSE: To relieve mild anxiety and tension.
COMPOSITION: Each tablet contains 200 mg. emylcamate.
DOSAGE AND ADMINISTRATION: 1 tablet three or four times daily, taken immediately before meals.
HOW SUPPLIED: Bottles of 100.
PRODUCER: Merck Sharp & Dohme, Division of Merck & Co., Inc., West Point, Pa.

• COAL TAR AGENTS

PURPOSE: To treat chronic dermatoses.
COMPOSITION: CARBO-DOME® Creme and Lotion: 5, 10 or 15 per cent liquor carbonis detergens.
CARBO-CORT® Creme and Lotion: 3 per cent liquor carbonis detergens with either ¼ or ½ per cent micronized hydrocortisone alcohol.
COR-TAR-QUIN® Creme and Lotion: 2 per cent liquor carbonis detergens, 1 per cent diiodohydroxyquinoline, and ¼, ½ or 1 per cent micronized hydrocortisone alcohol.
KOLPIX® Creme: 2 per cent whole crude coal tar, 5 per cent zinc oxide, and 10 per cent starch. The ingredients in the above agents are combined in an Acid MANTLE® vehicle.
DAXALAN® Creme: whole crude coal tar, zinc oxide and starch in an emollient base.
PRODUCER: Dome Chemicals Inc., New York.

• RYNATUSS® TABULES AND SUSPENSION

PURPOSE: Antitussive and decongestant therapy.
COMPOSITION: Each tabule contains:

Carbetapentane tannate	60 mg.
Chlorpheniramine tannate	5 mg.
Ephedrine tannate	10 mg.
Phenylephrine tannate	10 mg.

Each 5 cc. of suspension contains the above ingredients in one-half the amounts listed, with the exception of 4 mg. chlorpheniramine tannate.
DOSAGE AND ADMINISTRATION: The following doses are to be administered every 12 hours. Tabules: adults and children age 12 and older, 1 to 2; children age 6 to 11, ½ to 1. Suspension: children six months to two years old, ⅓ teaspoonful; age two to six, ½ to 1 teaspoonful; age 6 to 11, 1 to 2 teaspoonfuls; age 12 and older, 2 teaspoonfuls.
HOW SUPPLIED: Tabules: bottles of 30; suspension: 8 oz. bottles.
PRODUCER: Irwin, Neisler & Co., Decatur, Ill.

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Postgraduate Medicine

OCTOBER 1960

Operation Of A Professional Building - will not involve dangers of penalty taxes where doctors are the chief tenants as is frequently the case. The Internal Revenue Service now has acquiesced to a tax decision involving a group of Idaho doctors. The concession is of importance to others considering the construction of a professional building or medical clinic. Here is the background.

The doctors formed a corporation to construct and operate a professional and medical building. After construction was completed, the doctors, who were the stockholders, became the chief tenants of the medical building corporation. They paid reasonable rent to their corporation, sufficient in amount for it to meet its operating expenses and mortgage amortization.

Under the tax law, a closely-held company which gets most of its income from investment return runs the danger of being penalized as a personal holding company. The Internal Revenue Service originally claimed that the medical building corporation was a personal holding company, subject to penalty taxes. Under the personal holding company penalty provision, the Service would have been entitled to extra taxes - unless rents were received by the corporation from tenants who were engaged in the operation of bona fide "commercial enterprises." Interpreting the term "commercial enterprise" broadly, a court held that it included conduct of a medical practice. Penalty taxes were avoided as a result.

The Internal Revenue Service, in acquiescing, concedes the favorable decision correctly reflects the tax law. A group of doctors can organize a corporation to construct and operate a professional building from which the doctors will practice without fear that their corporation will be subject to personal holding company penalty taxes as a result.

The Doctor Who Buys A Co-operative Apartment - to be used both as a residence and as an office may not secure all the tax benefits he expects. For tax purposes, maintenance expenses of a co-operative apartment are treated somewhat similar to maintenance expenses of an individual house.

When a doctor purchases a house, he is allowed tax deduction for mortgage interest and real estate taxes. He is also entitled to depreciation deductions to the extent his house is used for professional purposes. When a doctor buys a co-operative apartment, he is entitled to deduct his proportionate share of mortgage interest and real estate taxes paid by his co-operative building. Such deduction is permitted under a special provision in the Internal Revenue Code. However, when the doctor purchases a co-operative apartment, he buys stock in the co-operative building. He has not made an investment in depreciable real estate. In a number of instances, agents recently disallowed depreciation deductions taken by doctors who maintain offices in their co-operative apartments.

If You Sell Your Home At A Profit - you can avoid tax on your gain by investing the sales proceeds in the purchase of a new home to be used as your principal residence within a 12 month period. You can also avoid tax on your profit by investing sales proceeds in the construction of a new home within an 18 month period. If you decide to invest sales proceeds in the construction of a new home, keep this tax point in mind. Commitment of sales proceeds in construction of a new home is not sufficient in itself to allow you to avoid tax on your profit. Actual construction must be completed within the 18 month period.

A professional man recently was penalized by this rule. Shortly after he sold his old home at a profit, he contracted to have a new home built. However, the contractor was delayed in starting construction. As a result, little work on the new home had been completed within 18 months and the profit on the sale of the old home was taxed.

Note that where a doctor used part of his home for an office, the Internal Revenue Service attempts to limit this avoidance of tax allowed on reinvesting sales proceeds in a new home. It says the doctor must allocate sales price in part to his home and in part to his office. He can avoid current tax only on that part of his sales profit which is attributable to home use. That part of his profit attributable to professional use is subject to current tax.

* * * * * *

When You Buy A Life Insurance Policy - of the participating type, you become entitled to future dividends. Depending upon the company issuing the policy, you may have a number of dividend elections. You might elect to have dividends applied to your premiums. Many insureds do that. You never see actual cash , reflecting the dividend. Your insurance company subtracts

the dividends from the premium notices it sends. You are billed only for the difference.

However, you might elect to receive the dividend in cash. Even if your insurance company sends you a dividend check, the amount is not taxable income. It still is a tax-free reduction of your premium cost. That's so even though you use the dividend for purposes other than premium payment.

An insured might elect to allow his dividends to accumulate with interest. You tell the insurance company to keep all dividends until you ask for them. Meanwhile, the company pays interest on the accumulated dividends. Although this is a convenient method of saving, it wasn't a popular election in the recent past. Interest rate on accumulated dividends was quite low - 2% to 2½%. However, companies now are paying a higher interest rate. Interest on accumulated dividends at 3½% is not uncommon - and a few companies pay even higher.

An insured may find it advantageous to use dividends to increase insurance coverage, e.g., to buy additional "paid-up" coverage. Purchasing additional insurance in this manner yields cost savings. Premium payment is not diluted by agent commission, expense of setting up a new policy record, and similar costs. The younger insured might check with his company to see if he can use dividends to buy low-cost, one-year term insurance. An increasing number of companies offer this dividend election of particular appeal to the younger man. Even a comparatively small dividend would allow the younger insured to substantially increase his insurance coverage for protection of his wife and growing children.

In Seeking Savings On Life Insurance Costs - you might check on the amount of discount available from paying premiums in advance. If your cash position permits it, you might find it worthwhile to pay premiums in advance. You are allowed a reduction - a saving - on insurance premiums paid in advance. Since World War II, the rate of this discount has been about 3%. But companies are now lifting this discount rate which means greater savings on premium paid in advance. Approximately 20 companies have lifted advance premium discounts to 4%. About 30 other companies have lifted their discount rates to 3 3/4%. A large number of other companies plan to follow suit.

Premiums you pay on your life insurance for family protection are non-deductible, personal expenses. They must come out of your after-tax income. Any saving on premiums therefore is an after-tax saving. A 4% premium discount saving has a taxable equivalent value in form of investment return of 6.4% for a married insured with taxable income of $20,000.

Joint Ownership Of Property By Family Members - is a legal relationship which should not be entered into lightly. It is widely believed that this form of ownership offers many advantages to a family without any drawbacks. In fact, it may offer little in the way of benefits and carry with it serious disadvantages.

Joint ownership may mean savings in administration cost on the death of one of the joint owners. The surviving owner then becomes sole owner without expenses of a probate proceeding. That probably is the chief advantage of joint ownership. But while joint ownership may mean a saving in probate expenses, it will not mean savings in estate or inheritance taxes. To the extent his funds were used to acquire jointly owned property, the property is taxable in the joint owner's estate. That is the Federal rule. Most states have a similar rule. Yet, heads-of-households continue to acquire property in joint ownership with spouse or a child in the mistaken belief that joint ownership will mean tax savings on death.

Only one out of every hundred persons realizes that when he puts property in the joint name of himself and another, he is making a gift of half the property's value. If the property has sufficient value, a taxable gift will have been made. Even though a gift tax is incurred at such time, the property will still be part of the donor's taxable estate on his death. The sole exception to this rule involves a married couple and real estate acquired in joint ownership. Thus, a husband will not have to pay a gift tax on the purchase of a home in joint ownership with his wife.

* * * * * *

In Seeking Capital Gain On Investment - which also offers a hedge against capital loss, don't overlook the convertible debentures of sound companies. As a debenture holder, you are a creditor so that the danger of big capital loss is minimized. Yet through the conversion feature, you can benefit when the issuing company's stock climbs in value. If stock goes up, your debenture will also. At that time, you might sell it for capital gain. Or you could convert it tax-free for issuing company's stock.

This summer, three well-known companies called their convertible bonds for redemption or conversion. In each instance, it was profitable for investors to exercise the conversion privilege. How did those investors who originally bought debentures at par make out?

A debenture holder of Alden's Inc., the Chicago mail order house, converted $1,000 face value into $1,350 stock values. A holder of Daystrom, Inc. secured $1,410 in stock values, and an RCA holder $1,350 in stock values.

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THE MEDICAL *Bookman*

► EPILEPSY AND RELATED DISORDERS

By William Gordon Lennox, M.D., Emeritus Associate Professor of Neurology, Harvard Medical School, Boston, and Margaret A. Lennox, M.D., Member, Institute of Neurophysiology, Copenhagen, Denmark. Vols. 1 and 2. 1,168 pages with 203 illustrations. 1960, Little, Brown & Company, Boston. $13.50 for the two volumes.

Many books have been written on epilepsy, some of them landmarks in this subject, such as those by Reynolds and by Gowers, the writings of Hughlings Jackson and, in our own day, those of Wilder Penfield. The present volumes representing the professional life work of the late W. G. Lennox, ably assisted by his daughter, is an encyclopedia of the present-day knowledge of epilepsy. Dr. Lennox was an outstanding leader in the field, and he was admired and respected by all those who worked with him or came under his influence.

Volume 1 describes all phases of paroxysmal disorders, the historical perspective, orientation, the petit mal and convulsive triads, psychomotor and autonomic epilepsy, status epilepticus, childhood convulsions, and the borderlands and genetics of epilepsy.

Volume 2 includes discussions on acquired epilepsy, sympathetic seizures, the mind and personality, origin of epilepsy, electrobiology and electropathology, methods of diagnosis, and therapy. Also discussed are social-emotional problems, prevention, and the various professional and lay persons, institutions and organizations caring for epileptic patients.

The senior author's personality seems to be present throughout the two volumes. The chapters are written much in the manner in which he spoke at the many meetings he attended. This is of course more obvious to those who knew him, but his style is distinctive. His knowledge of the subject was vast, but he made no effort to be dogmatic or tutorial. It seems to this reviewer that his interest was so deep and so widespread that he holds the reader's interest in his book as he did in his discussions.

H. M. K.

► OFFICE DIAGNOSIS

By Paul Williamson, M.D. 470 pages, illustrated. 1960, W. B. Saunders Company, Philadelphia and London. $12.50.

Dr. Williamson, a former general practitioner, is a prolific and knowledgeable writer. He states in the preface of this book, "I cannot warn the physician too pointedly that the medical teaching and philosophy of today constantly emphasize the complex and difficult, while 99 per cent of human ills are of simple and direct nature. It is a little foolish to be an expert for 1 per cent of one's practice and indifferently competent for 99 per cent of it, yet this can and often does happen."

The first discussions in the book deal with nonspecific symptoms. These are followed by consideration of symptoms of the head, neck and chest and those observed in each of the various systems of the body. The text is direct in approach and easily understandable.

I recommend this volume to all general practitioners, and suggest that most specialists use it as a refresher in the general fields of medicine.

I. P. F.

(Continued on page A-206)

► CHRISTOPHER'S TEXTBOOK OF SURGERY

Edited by Loyal Davis, M.D., Chairman, Department of Surgery, Northwestern University Medical School, Chicago, with 82 contributors. Ed. 7. 1,549 pages with 1,597 illustrations. 1960, W. B. Saunders Company, Philadelphia and London. $17.00.

Probably the most widely used textbook of surgery in medical schools, this volume continues to be a standard reference for many practitioners. As most of the contributing authors hold teaching positions, the opinions given represent current academic thinking in general surgery.

In the four years since the sixth edition was published, great strides have been made in many fields, particularly in cardiovascular surgery and in the application of physiology and biochemistry to problems in general surgery. The current edition has been extensively rewritten and several new sections have been added.

Surgical technic is not described in a step-by-step manner; the principles are presented without the details of practical application. For example, the basis for vagotomy for peptic ulcer is discussed in detail; but, although the author states that with experience the surgeon will be able to do a more complete vagotomy, he does not mention the reasons for failure to attain complete vagotomy.

The first 10 chapters are on the broad principles of surgery and, since some of the greatest advances in surgery have been made in these areas, this portion is very valuable. This section forms a necessary and solid groundwork for the ensuing chapters on the management of surgical diseases described under various anatomic and organ systems.

All the specialties and subspecialties of general surgery are covered, some in considerable detail and others only superficially. Some serious omissions also are apparent. In the section on crush injuries of the chest, no mention is made of the indications for and value of tracheostomy. Currently, thoracic surgeons feel that a tracheostomy may be a lifesaving maneuver in severe chest injuries. The urgent problem of postoperative staphylococcal enteritis also is not covered adequately. No mention is made of air embolism or fat embolism.

Of particular interest to those who are teaching are the last two chapters, in which the qualifications of a surgeon and surgical judgment are discussed. Both are well written; the thoughts expressed are worthy of consideration by students and especially by those about to embark on the specialty of surgery.

Y. S.

► ROENTGEN EXAMINATIONS IN ACUTE ABDOMINAL DISEASES

By J. Frimann-Dahl, M.D., Professor of Roentgenology, University of Oslo, Norway. Ed. 2. 518 pages with 446 illustrations. 1960, Charles C Thomas, Springfield, Illinois. $15.50.

A classic work on the radiology of abdominal diseases, this text has always been an indispensable guide for the radiologist. Extensive revision in this edition has increased its value; even owners of the first edition will find profit in reading the second.

The major additions and revisions are in the sections on experimental results in investigating roentgenographic findings in intestinal obstruction, intussusception, volvulus of all portions of the gastrointestinal tract, acute pancreatitis, and abnormalities of the urinary tract. The section on intussusception is markedly improved, and several excellent color photographs made at operation or autopsy have been added to the section on volvulus of the gastrointestinal tract. A comment on radiation hazards has also been added.

In a work of such general excellence, it is perhaps picayune even to discuss minor faults. Figure 87, which was inverted by the printer in the first edition, is properly positioned and appears as figure 103 in the second edition. However, figure 88 which was properly oriented in the first edition has been inverted in the second edition, where it appears as figure 104. All the roentgenograms are presented in the negative in the usual American style, with the one inexplicable exception of figure 168, which is reversed.

In the foreword, Dr. Owen H. Wangensteen, University of Minnesota Medical School, states: "This illustrious monograph deserves a high place amongst the important benefactions of Scandinavian roentgenologists to medicine." This reviewer can only substantiate this statement and add that this monograph should be in the library of every radiologist, surgeon and diagnostician.

R. D. M.

(Continued on page A-208)

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1. Cornely, D. A., and Ritter, J. A.: N-acetyl-p-aminophenol (Tylenol Elixir) as a Pediatric Antipyretic-Analgesic, J.A.M.A. *160*:1219 (Apr. 7) 1956.
2. Mintz, A. A.: Management of the Febrile Child, J. Ky. Acad. Gen. Pract. *5*:26 (Jan.) 1959.

► MANUAL OF HAND INJURIES

By H. Minor Nichols, M.D., Clinical Instructor in Surgery, University of Oregon Medical School, Portland. Ed. 2. 400 pages with 205 illustrations. 1960, The Year Book Publishers, Inc., Chicago. $11.00.

As in the original volume, the material in this present edition describes the author's personal, up-to-date experience in the treatment of acute injuries and infections of the hand.

The well-organized text provides an extensive and complete consideration of the anatomic aspects involved, and these aspects are used as the basis for a majority of the treatments suggested. Careful line drawings and superior photographs depict methods of treatment and present forms of local anesthesia. For example, excellent drawings demonstrate the technic of blocking the median and radial nerves at the wrist and the ulnar nerve at the elbow to provide adequate anesthesia for operations on the hand.

Emphasis is placed on preoperative and postoperative care, and considerable attention and many illustrations are devoted to proper immobilization of the hand. The text subsequently deals with proper care of burns, traumatic injuries, traumatic amputations, and injuries to tendons, muscles and nerves. Fractures, dislocations and primary and secondary infectious processes of the hand are thoroughly covered, and elective and reconstructive procedures for the damaged hand are well presented.

E. W. J.

► TREATMENT OF URINARY LITHIASIS

Edited by Arthur J. Butt, M.D., Attending Urologist, Baptist Hospital, Pensacola, with 32 contributors. 577 pages with 189 illustrations. 1960, Charles C Thomas, Springfield, Illinois. $21.00.

The title of this volume is deceptive, since not only the treatment but also the historical background, theories of etiology, pathogenesis, and the diagnosis of urinary calculi are dealt with in considerable detail. Several chapters deserve separate mention, including Butt's fascinating and lucid description of the history of urinary lithiasis, Creevy's detailed discussion of the preoperative and postoperative management of patients with urinary lithiasis, and Snapper and Gechman's scholarly dissertation on the medical management of renal calculous disease caused by abnormal excretion of calcium and phosphorus. The role of colloid in the development of urinary lithiasis is interestingly presented by Butt and Leonard. Mulvaney's presentation of the present and future ultrasonic treatment of urinary lithiasis is intriguing.

This comprehensive text is well written and will serve as a valuable reference for many years.

M. P. R.

► SURGERY IN WORLD WAR II
Neurosurgery

Edited by R. Glen Spurling, M.D., Professor of Neurosurgery, University of Louisville School of Medicine, Louisville, and Barnes Woodhall, M.D., Professor of Neurosurgery, Duke University School of Medicine, Durham, North Carolina. with 20 contributors. Vol. II. 705 pages, illustrated. 1959, U. S. Government Printing Office. Washington, D. C. $7.00.

The second volume in a series on surgery during World War II, this text deals with injuries and diseases of the spinal column and spinal cord and injuries of peripheral nerves. The text is unusually well illustrated by excellent photographs and many exceptionally lucid diagrams.

Both subjects, injuries to the spinal column and spinal cord and injuries of peripheral nerves, are considered not only from the neurosurgical aspect but also from the broad approach of total treatment. In the management of injuries to the spinal column and spinal cord, every phase from first-aid treatment and transportation to physiotherapy and consideration of morale is covered. This complete presentation of the subject has been possible because the list of contributing authors includes orthopedists, urologists, anatomists, neuropathologists and others in addition to neurosurgeons.

Most of the material included in this book constitutes valid treatment today. Moreover, the text documents the courageous, forthright and sincere efforts of many men who were dedicated to rehabilitate to the fullest possible degree those of our military forces who sustained and endured these serious injuries.

H. J. S.

(Continued on page A-210)

WHEN ULCEROGENIC FACTORS KEEP ON WORKING...

REMEMBER THIS: SO DOES ENARAX

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Think of the anxieties, the tensions.

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References: 1. Steigmann, F., et al.: Am. J. Gastroenterol. 33:109 (Jan.) 1960. 2. Hock, C. W.: to be published. 3. Leming, B. H., Jr.: Clin. Med. 6:423 (Mar.) 1959. 4. Data in Roerig Medical Department Files.

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► HANDBOOK OF NEUROLOGICAL DIAGNOSTIC METHODS

Edited by Fletcher McDowell, M.D., Assistant Professor of Medicine (Neurology), and Harold G. Wolff, M.D., Anne Parrish Titzell Professor of Medicine (Neurology), Cornell University Medical College, New York. 201 pages, illustrated. 1960, The Williams & Wilkins Company, Baltimore. $4.50.

Covering a wide range of subjects in a highly condensed manner, this ring-bound manual was developed for the instruction of medical students at Cornell University Medical College. Approximately one-third of the book is devoted to the customary neurologic examination, which is described in a manner comparable to that used in a number of other standard texts. Brief sections are devoted to such subjects as pneumoencephalography, arteriography, myelography and laminography, and discussions are primarily centered on the technics of executing examinations. A somewhat longer section is devoted to examination of the visual fields. Electroencephalography is covered in 15 pages, of which only three deal with abnormalities in the electroencephalogram.

This volume apparently was intended as an outline which would be supplemented by lectures. For readers who are practicing physicians this form places great limitations on the usefulness of the book, since it offers no interpretation and no analysis of the significance of findings obtained by examination.

D. D.

Books received are acknowledged in this department. As space permits, books of principal interest to our readers are reviewed more extensively.

P-Q-R-S-T; a Guide to Electrocardiogram Interpretation. By Joseph E. F. Riseman, M.D., Assistant Clinical Professor of Medicine, Harvard Medical School, Boston. Ed. 4. 168 pages, illustrated. 1960, The Macmillan Company, New York. $6.50.

A Dictionary for Medical Secretaries. By Isabel Alice Stanton, Secretary, Director of Graduate Training, Baylor University College of Dentistry, Houston. 175 pages. 1960, Charles C Thomas, Springfield, Illinois. $6.50.

Classics of Medicine and Surgery. Formerly titled "Epoch-Making Contributions to Medicine, Surgery and the Allied Sciences." Collected by C. N. B. Camac, M.D. 435 pages, illustrated. 1960, Dover Publications, Inc., New York. $2.25.

Industrial Pulmonary Diseases. A symposium. Edited by E. J. King, D.Sc., and C. M. Fletcher, M.D., Postgraduate Medical School of London. 273 pages with 98 illustrations. 1960, Little, Brown & Company, Boston. $8.00.

Nonpenetrating Injuries of the Abdomen. American Lecture Series. By Robert H. Kennedy, M.D., Consulting Surgeon, Beekman-Downtown, Bellevue and University Hospitals, New York. 121 pages. 1960, Charles C Thomas, Springfield, Illinois. $4.75.

Pediatric Nursing. By Gladys S. Benz, R.N., Chairman, Department of Maternal and Child Nursing, State University of Iowa, College of Nursing, Iowa City. Ed. 4. 572 pages with 109 illustrations. 1960, The C. V. Mosby Company, St. Louis. $6.00.

Bird-Headed Dwarfs. Studies in developmental anthropology including human proportions. By Helmut P. G. Seckel, M.D., Professor of Pediatrics, University of Chicago School of Medicine, Chicago. 241 pages with 64 illustrations. 1960, Charles C Thomas, Springfield, Illinois. $10.00.

Intraarterial Infusion of Procaine in Therapeutic Practice. By N. K. Gorbadei, with a supplement, "The treatment of patients with hypertension by intra-arterial infusion of procaine solution," by I. I. Velikanov. 135 pages, illustrated. 1960, Consultants Bureau, Inc., New York.

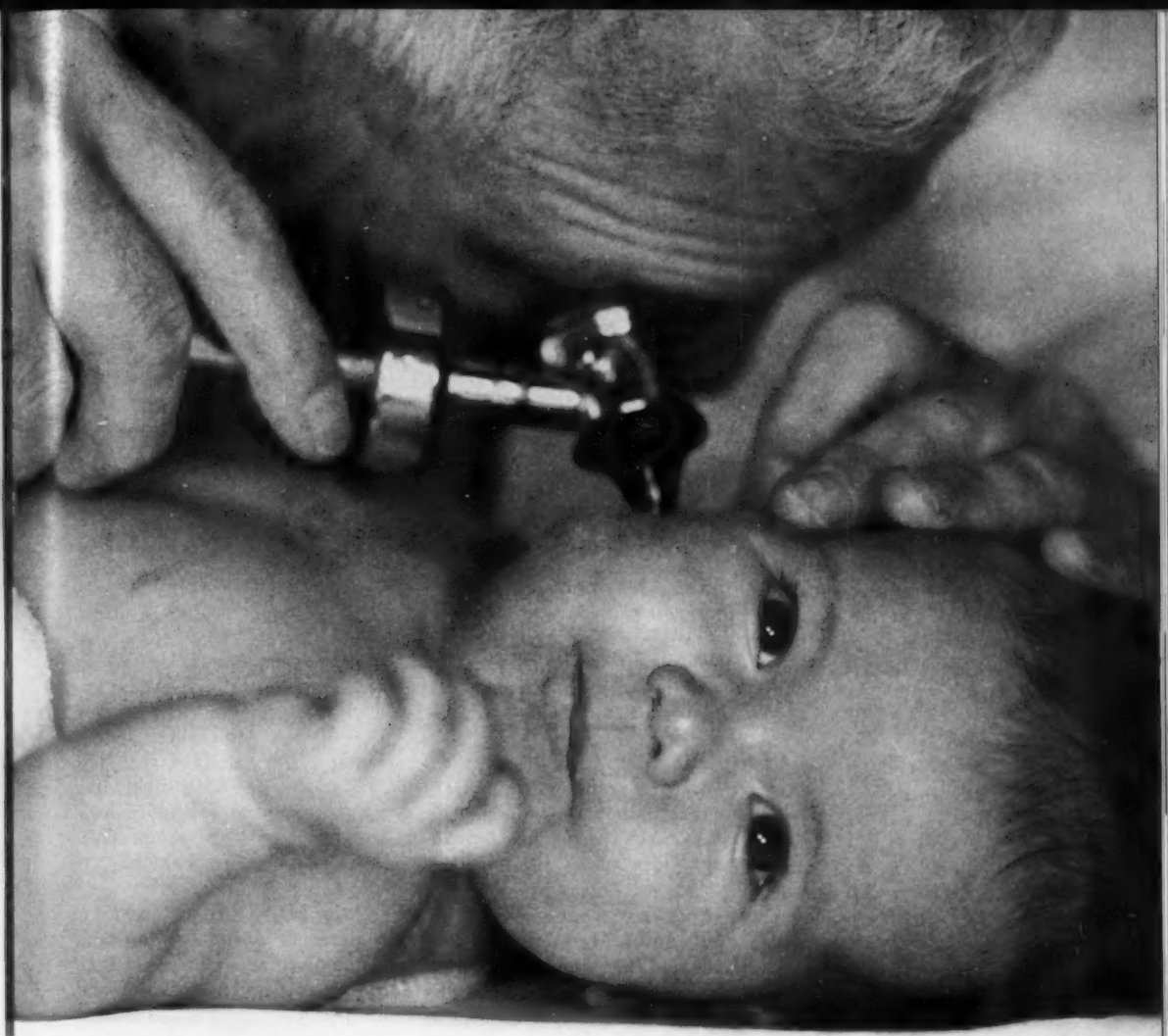
Postmortem Homografts. By James Barrett Brown, M.D., Professor of Clinical Surgery, and Minot P. Fryer, M.D., Associate Professor of Clinical Surgery, Washington University School of Medicine, St. Louis. 64 pages, illustrated. 1960, Charles C Thomas, Springfield, Illinois. $5.50.

Viral Infections of Infancy and Childhood. Symposium of the Section on Microbiology, The New York Academy of Medicine, New York. Edited by Harry M. Rose, M.D., John E. Borne Professor of Medical and Surgical Research, Columbia University College of Physicians and Surgeons, New York, with 35 contributors. No. 10. 244 pages, illustrated. 1960, Paul B. Hoeber, Inc., Medical Book Department of Harper & Brothers, New York. $8.00.

Neurochemistry of Epilepsy; Seizure Mechanisms and Their Management. American Lecture Series. By Donald B. Tower, M.D., Chief of Section of Clinical Neurochemistry, National Institutes of Health, Bethesda. 335 pages, illustrated. 1960, Charles C Thomas, Springfield, Illinois. $9.00.

Social Drinking; How to Enjoy Drinking Without Being Hurt by It. By Giorgio Lolli, M.D., Director, International Center for Psycho-Dietetics. 317 pages. 1960, The World Publishing Company, Cleveland and New York. $4.50.

Fluid Balance in Obstetrics; a Critical Review. By Philip Rhodes, F.R.C.S., Consultant Obstetrician and Gynecologist to St. Thomas's Hospital, Lambeth Hospital and General Lying-in Hospital, London and Horsham Hospital, Horsham, England. 169 pages. 1960, The Year Book Publishers, Inc., Chicago. $5.75.



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DR. Pepys' Pages

Personal Diary
and Observations on
Medical Life
by MORRIS FISHBEIN, M.D.

July 30—To the boulevards, finding Paris strangely quiet because apparently at least half the city takes its holiday at the same time. To dinner at the Copenhague, which comes as a fine ending to a walk that begins at the Carousel and ends at the Arch of Triumph.

July 31—A Sunday, and so to the museums and to Montmartre, where a painter stands with an easel every 20 ft. To dine at night at the E'paladon came Herbert Mayes with Grace; Vicki, who has been working in Paris for some months; and Alex, who came along for the ride.

Aug. 1—Now to the shops to purchase ties, mufflers and knick-knacks of various kinds. Also in the bookstores, which show little that is new. The afternoon and evening spent in packing for the return trip on the morrow.

Aug. 2—By Pan American flight on time to New York. To the airport came Rose Soroko and her sister for a fine reunion. So late to the Waldorf.

Aug. 3—A day of many meetings and telephone calls to all the associates. In the afternoon with Milton Runyon after a luncheon with Bill White at the Marco Polo Club, which, newest of all, is in the Waldorf where the Norse Grill used to be. On the late afternoon plane to Chicago, where the Friedells were at the airport. With them to view the hospital, now adorned with its refurbishings.

Aug. 4—All this day and in the night too at the desk, which is piled high with the accumulation of months of press releases, periodicals and publications. At night to dine with Mistress Pepys at Citro's and found that, as we remembered, the chicken Kiev is better than that made in Russia.

Aug. 5—On Don McNeill's Breakfast Club, where there was much discussion of the illnesses of musicians and weird questions from the audience. Next to the University Club to sit with the board that discusses problems of identification. After that at the desk for extended scrivening, reading in the meanwhile the suspense tale "Watcher in the Shadows," by Geoffrey Household.

Aug. 6—Reading now the life of Rudolph Matas, by Isidore Cohn and Hermann Deutsch, both friends of long standing, and this is a dramatic life of a surgeon who was a scholar. In the evening to Francois Pope's, where were many friends, including Maximilian Kern and his talented daughter. And the food was so marvelous that Hugh Scott, chief editor for Macmillan, says he will sell a million cookbooks —and he probably will.

Aug. 7—Driving to Highland Park and took all the Marks family to Sunday brunch at the Moraine, finding the rose garden most charming. Then with Justin and his crew to dine near the Wisconsin line at the Country Squire, where there were good cuisine and excellent service.

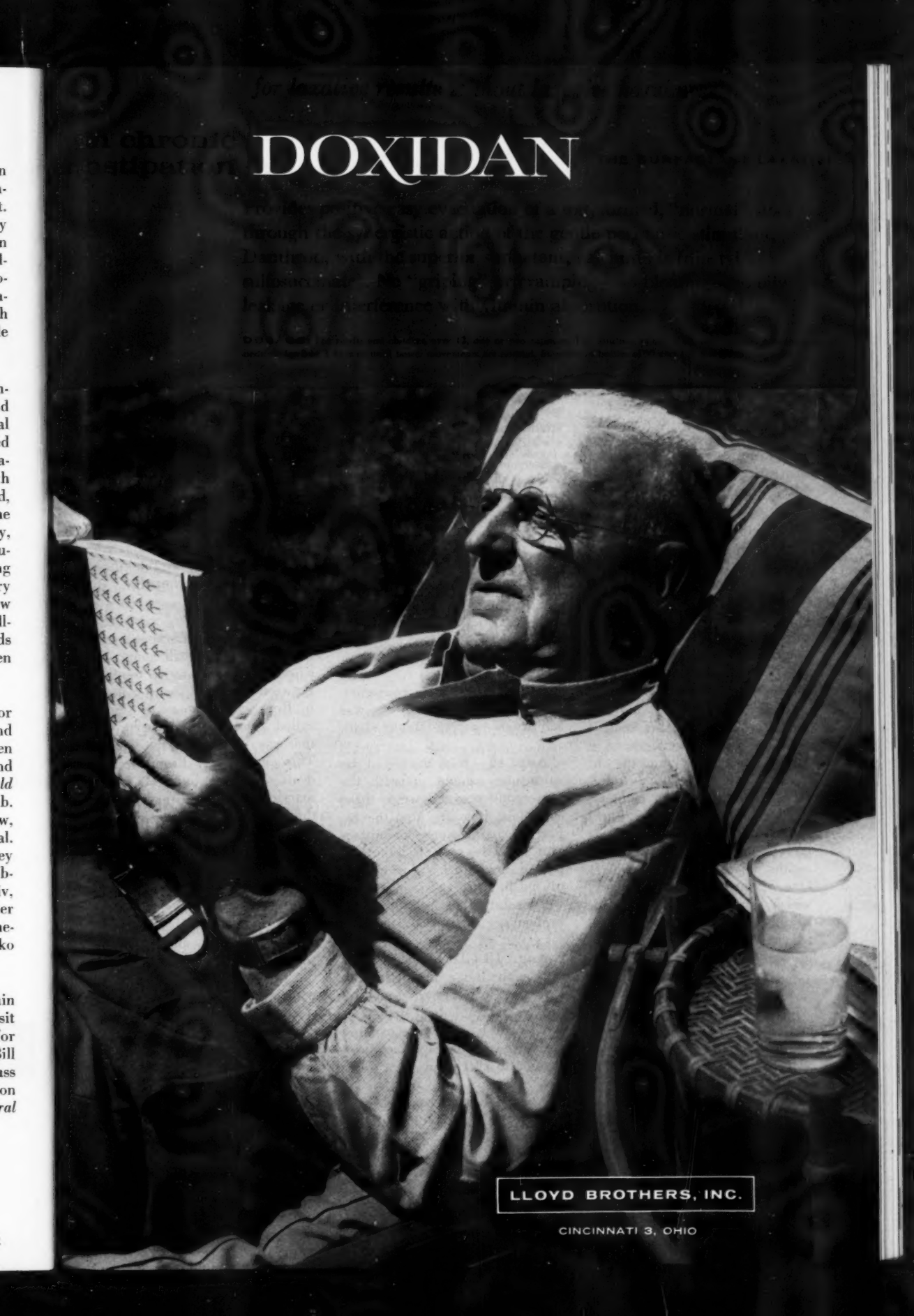
Aug. 8—The mail pours in and the difficulties of stenographic substitutes become apparent. Reading also the autobiography of Aldo Castellani, "A Doctor in Many Lands." The book is a collection of miscellaneous memories and scraps from a diary, insufficiently connected yet worth the time because of the notable contributions of the author.

Aug. 9—Scheduled by Northwest to Idlewild; waited around an hour because of mechanical difficulties, and then transferred to TWA tourist, ending at La-Guardia. Then driving with Charles Haney to New Milford, Connecticut, where I visited the hospital, enjoyed a cocktail party, and spoke to an enthusiastic audience of 800. In the evening Drs. Robert Miller and Jeffery Ferris of the staff of the New Milford Hospital also spoke, telling of the need for more beds and for a recovery room. Then drove back to the Waldorf.

Aug. 10—To Doubleday's for conferences with Runyon and Whittemore on new books; then for lunch came Bill White and we planned for *Medical World News* at the Marco Polo Club. In the afternoon with Esterow, who plans a dental periodical. Then with Mark Soroko, Mickey Axelrod and Ben Ami, who publishes *The Tageblatt* in Tel Aviv, to dine at the Black Angus, after which engaged in a tight mathematical contest in which Soroko demonstrated his usual skill.

Aug. 11—This morning again to Doubleday's and then to visit the stacks at Taylor-Carlisle's for unusual books. Next came Bill Marsden and Ellwood Douglass for an editorial conference on *World-Wide Abstracts of General*

(Continued on page A-230)


DOXIDAN
LLOYD BROTHERS, INC.
CINCINNATI 3, OHIO

Medicine. For luncheon with Max Geffen and Bill White, contriving new concepts in medical news reporting. In the evening to dine with Elmer Bobst, Alfred Driscoll and Bill Lasdon, talking of Russia and hearing of a recent visit to the always exciting Hans Selye in Montreal. Then to Idlewild to catch Northwest's last evening plane to Midway Airport.

Aug. 12—Writing answers to questions, letters of thanks, editorials and book reviews, and betweentimes watching the baseball game and reading Henry Morton Robinson's "Water of Life," the first novel in which the great congressional debate "What is whiskey?" is fully elucidated.

Aug. 13—To Ravisloe with Maurice Goldblatt, talking en route of what I saw in Russia of research on cancer. So stopped at the ninth hole by rain after playing like a once-in-a-while golfer; did better at once-in-a-while gin.

Aug. 14—The apartment is disrupted with house cleaning, a sad spectacle indeed, and the old master finds himself pursued from room to room by painters, scrubbers, carpenters, upholsterers, maids with vacuum cleaners and dusters, decorators, locksmiths, engineers and plumbers. One of them came on Sunday, which should be a day of rest, so old Pepys watches baseball on television, and wonders when it all will end.

Aug. 15—The working crew returns and in the midst of the carnage old Pepys sits pounding away at the Olivetti.

Aug. 16—To Ravisloe to play with Goldblatt, Dolin and Gordon, and in the evening the ladies joined us, and we ate congenially and well, and all the day was salubrious—no plasterer in sight.

Aug. 17—With the aid of the substitutes, caught up with the correspondence and wrote three editorials. Reading now the reports of commissions, committees and agencies which have appeared since April, a glorious pile of much activity, pointing toward solution of many medical problems.

Aug. 18—To lunch at Fritzel's with Judge Marovitz, Pat Hoy and Carole Levy, designing the "Salute to Medical Research" for December. In the evening seeing the White Sox toss away a game to Cleveland.

Aug. 19—At the desk and then to the country club to play at golf, but it rained, so played mathematical games instead and did better than usually. In the evening reading "Taken at the Flood," the story of Albert D. Lasker, by John Gunther, and found that Gunther had treated Lasker most kindly in the biography and that entirely missing are a few incidents which appear in other biographies. Albert Lasker was a genius in the handling of thoughts of masses of people and, withal, a man who thought with his emotions as well as with his brains.

Aug. 20—Watching the baseball games on television while sipping cold drinks and reading books of humor. The modern humorist is much more a satiric philosopher than were the kindly humorists of an earlier day.

Aug. 21—Writing many editorials and in the afternoon again watching the baseball game, because the heat is now in the 90s. Betweentimes read the new novel by Rona Jaffe, who wrote a book called "The Best of Everything" that was designed for the movies. This one, "Away From Home," deals with the lives of young married couples in Brazil and the difficulties of the young married women in offsetting the advances of the Brazilian wolves; however, they did not try too hard.

Aug. 22—This day came Ann with Amy Louise, Morris Daniel and Anna Marie and left them with us for a visit, and much of the time they were occupied in walking by the lake, reading stories, and being generally very entertaining.

Aug. 23—Again at the desk for a brief period and in the afternoon with the little ones to

(Continued on page A-233)

HYPOCHONDRIAC

It's useless to try to convince her
  There isn't a thing that is wrong;
She's perfectly certain that something
  is hurtin',
  She's felt it for sure right along.
Unless you suggest that she's due for
  a rest,
  She'll probably have a conniption,
And, oh, how unhappy she'll be if
  she leaves
  Your office without a prescription!

Stephen Schlitzer

* * *

The Frenchman who is suffering from sciatica suffers still more because he has to keep quiet about his 1954 sciatica and listen to the other fellow's 1951 neuritis.

Everyone knows that since the whole world is English-speaking, the Englishman's privilege is to understand no language other than his own.

* * *

SCIENTIFIC

A surgeon heard the following conversation between two nurses:

"I kissed the doctors last night at the dance."

"Intern?"

"No, alphabetically."

* * *

the country club, where they swam and enjoyed it immensely.

Aug. 24—To meet with Robert Dachman to discuss problems of medical education. In the afternoon once more to the country club and found the going quite good, particularly as I played with Friedell, who is much better at the game than I.

Aug. 25—Early completing the mail and late in the afternoon with Maurice Goldblatt to Ravisloe, cheering him by the quality of his playing, and in the evening to catch up on long-distance with all the work missed during the day. Reading now Jerome Weidman's "Before You Go," which fictionizes Harry Hopkins, and finding him writing now with a masterly skill that is a result of continuous growth since his earliest ventures into fiction.

Aug. 26—At my work and late in the afternoon came all the Marks family to dine with us and to leave Georgia, who will accompany us to New York.

Aug. 27—To New York and to the Waldorf, and there found a great multitude assembled for the eighth world congress of the International Society for the Welfare of Cripples. So attended to matters of registration, and young Pizetti came early to speak of the arrangements made for Dr. Marino-Zuco. In the evening to the home of Henry Kessler in Newark, where several hundred persons attended a great reception, and it was delightful to meet delegates from South Africa, Israel, Poland and many other nations around the world. Thereafter in the air-conditioned bus in the midst of the high humidity back to New York.

UTOPIA

An office, smart yet comfortable,
A charming nurse, and skilled,
The newest type of instruments,
Appointment book that's filled;
A spacious, gracious waiting room,
By quiet patients bordered,
This seems to be—and you'll agree—
Just what the doctor ordered!

Stephen Schlitzer

* * *

SOME FIFTY YEARS AGO

Dec. 22, 1907—Dr. C. St. Clair Drake, chief of the municipal bureau of vital statistics, announces that in 1907 heart disease caused the death of 2,497 Chicagoans. "Our strenuous life, too much eating and too much drinking, is responsible," the doctor asserts.

Jan. 11, 1908—Dr. Frank Billings startles members of the Commercial Club when he asserts that one million persons in Illinois have tuberculosis in some degree.

Dec. 30, 1907—Lucy Page Gaston, arch foe of the cigarette, makes the rounds and is relieved when she finds no women smoking in public.

Jan. 12, 1908—Dr. Nicholas Senn dies at his Dearborn Avenue residence. He was in his sixty-fourth year. —From Chicago history.

* * *

Aug. 28—To the United Nations building and with Georgia Marks took the tour, our guide being a pleasant damsel from Pennsylvania named Kupp, whose father is a physician, and this tour was most enlightening and because of the gorgeous demonstration of art and architecture worth everyone's time.

In the afternoon to the mansion of Mayor Wagner and there under great tents on the lawn were assembled again the delegates from far and wide, with music playing and refreshments provided. Mistress Pepys and Georgia toured the mansion itself, enjoying particularly the paintings and the antiques and a breakfront with perhaps a dozen Flora Danica plates.

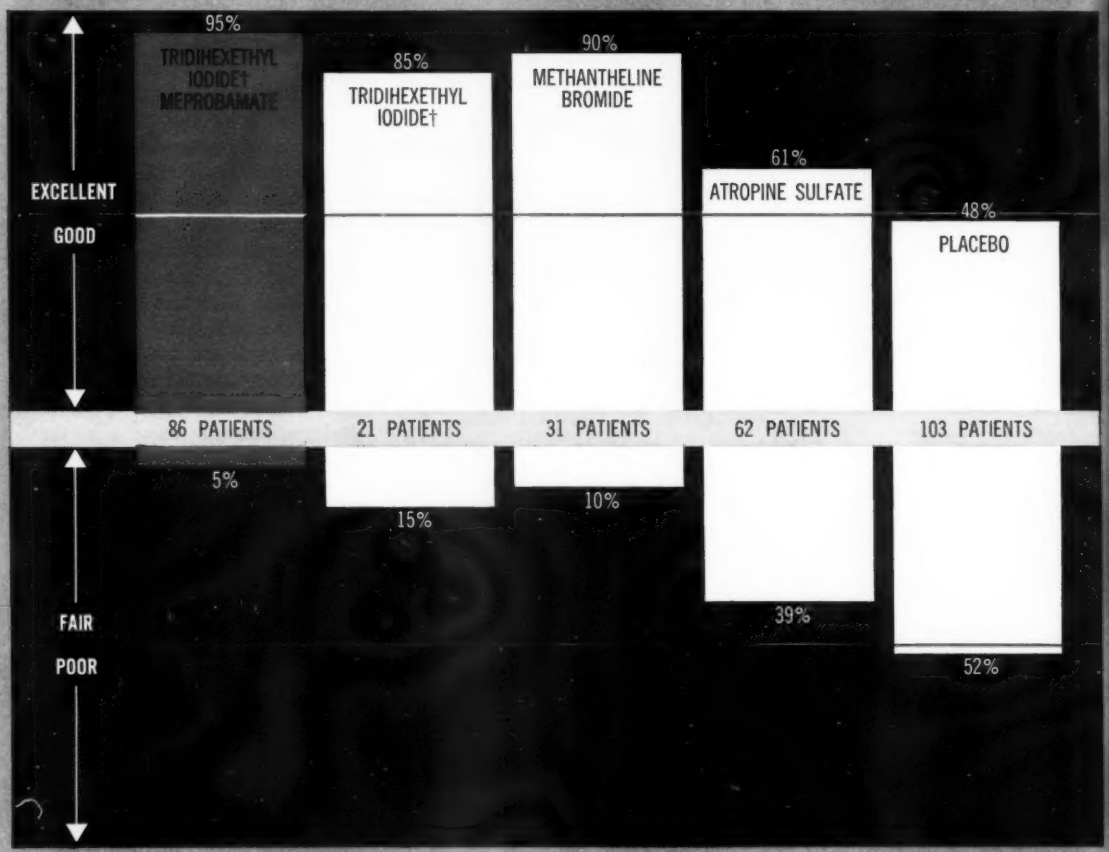
In the evening to the grand ballroom of the Waldorf, where was the opening session of this great conference. Howard Rusk presided with great humor and gentility. The occasion was graced by the Marine band from Washington, D. C., and its accordion soloist was among the great. Here also came the assistant postmaster general to present an "Employ the Handicapped" stamp, prepared especially for this occasion. Then delegates from each of more than 49 nations in attendance received souvenir albums of the stamps. Next came Bernard Baruch to tell of his interest in the handicapped because of the work of his great father Simon Baruch in hydrotherapy, and Secretary Flemming eulogized the great accomplishment of Howard Rusk and Mary Switzer in rehabilitating the handicapped. And this was altogether one of the finest occasions that I have witnessed. Most impressive perhaps was the massing of the colors of all the nations, the flags being carried by boy scouts, some of whom were handicapped. The scouts had assembled here in New York from all the nations represented in this great city.

Aug. 29—Attending a session of the congress and viewing the exhibits. At noon came Messrs. Mel Glasser, Tom Rivers and Stan Henwood to luncheon at the Marco Polo Club, which we found most enjoyable. In the afternoon Peter Warren brought the second record of "The Voice of Medicine," and Carleton Smith also came to speak of public relations and medical and general writing. In the evening to dine and then to see a play of the teen-agers called "Bye Bye Birdie," which is a pleasant musical comedy telling in particular of the teen-agers and their problems. The play has delightful set-

(Continued on page A-236)

clinically proven efficacy.

in relieving tension . . . curbing hypermotility and excessive secretion in G. I. disorders



PATHIBAMATE combines two highly effective and well-tolerated therapeutic agents:

Meprobamate—widely accepted tranquilizer

and

PATHILON tridihexethyl chloride—anticholinergic noted for its effect on motility and gastrointestinal secretion with few unwanted side effects.

Contraindications: glaucoma, pyloric obstruction, and obstruction of the urinary bladder neck.

Two available dosage strengths permit adjusting therapy to the G.I. disorder and degree of associated tension.

Where a minimal meprobamate effect is preferred . . .
PATHIBAMATE-200 Tablets: 200 mg. of meprobamate; 25 mg. of PATHILON

Where a full meprobamate effect is preferred . . .
PATHIBAMATE-400 Tablets: 400 mg. of meprobamate; 25 mg. of PATHILON

Dosage: Average oral adult dose is 1 tablet t.i.d. at mealtime and 2 tablets at bedtime.

Pathibamate® 400 200

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clinically proven safety

The efficacy of PATHIBAMATE has been confirmed clinically in duodenal ulcer, gastric ulcer, intestinal colic, spastic and irritable colon, ileitis, esophageal spasm, anxiety neurosis with gastrointestinal symptoms, and gastric hypermotility.

Pictured are the results obtained with the PATHILON (tridihexethyl iodide)–meprobamate combination† in a double-blind study of 303 ulcer patients, extending over a period of 36 months.* They clearly demonstrate the efficacy of PATHIBAMATE in controlling the symptoms.

SIDE EFFECTS	TRIDIHEXETHYL IODIDE† MEPROBAMATE	TRIDIHEXETHYL IODIDE†	METHANTHELINE BROMIDE	ATROPINE SULFATE	PLACEBO
DRY MOUTH	1%	5%	72%	46%	5%
STOMATITIS	1%	0%	28%	14%	0%
VISUAL DISTURBANCES	0%	0%	50%	34%	1%
URINARY RETENTION	0%	0%	18%	11%	1%
DROWSINESS	20%	0%	0%	0%	0%
COMPLICATIONS OR SURGERY					
HEMORRHAGE	0%	9%	3%	9%	10%
PERFORATION	0%	0%	0%	6%	0%
OPERATION	0%	5%	5%	14%	2%
RECURRENCES					
NONE	28%	23%	25%	17%	26%
FEWER AND MILDER	67%	62%	52%	37%	24%
SAME OR MORE	5%	15%	23%	46%	50%

*Atwater, J. S., and Carson, J. M.: Therapeutic Principles in Management of Peptic Ulcer. Am. J. Digest. Dis. 4:1055 (Dec.) 1959.

†PATHILON is now supplied as tridihexethyl chloride instead of the iodide, an advantage permitting wider use, since the latter could distort the results of certain thyroid function tests.

Lederle LEDERLE LABORATORIES, A Division of AMERICAN CYANAMID COMPANY, Pearl River, New York

control the tension — treat the trauma

tings, wonderful dancing arranged by Gower Champion, and much comedy.

Aug. 30—At breakfast with Bill White to discuss the problems of *Medical World News*. At noon with Mistress Pepys and many of our friends from abroad to the yacht Alisa V of Elmer Bobst. Here came the Valls, of Buenos Aires; the Epsteins and Dr. Krause, of South Africa; R. Hulek, of Warsaw; and Lady Corea, of Ceylon, and her sister, who is director of welfare; Mary Switzer, with whom there is great honor because of her leadership; Max Geffen, and Bill White. This was altogether a wonderful pleasure. We sailed on the Hudson up to the mouth of the river and enjoyed a little breath of air amidst the humidity. In the afternoon at my desk, and in the evening to see "Take Me Along," with Jackie Gleason and a wonderful young actor, and this play is based on O'Neill's "Ah, Wilderness," which should not deter anyone from attending because it is full of high humor.

Aug. 31—Waking to a pouring rain, which did nothing to decrease the humidity. To Doubleday's, where with Milton Runyon, Ralph Beebe, Dick Whittemore, Gibbs and others discussed the progress in relation to the book on heart care. Thereafter to Warwick & Legler's to sit with Swackhammer, who is a cousin of my classmate of many years ago, and we reminisced and then talked of the advertising-educational script. Next with Henry Legler to discuss a new product, and finally to bid good-by to Paul Warwick, who is to depart soon for Amsterdam, Cologne and Berlin.

In the afternoon to the sessions of the congress on the welfare of the crippled, and next to another conference dealing with new research on alcohol. Later to watch the final innings of the second game of the Yankees v. Kansas City. To cocktails at the Delmonico with Charles Gratz; Fred Albee, Jr.; and Schuldice, of Toronto, and met there many of the young ladies of the United Hospitals and doctors from Persia and elsewhere, and had fine conversations on conditions around the world. In the evening to dine at Lindy's, and then walking along Broadway at night showed Georgia the magnificent lighting and the offerings of the shops.

The Medical Muse

RICHARD ARMOUR

MUSCLING IN

A researcher says that muscles emit electric signals in a frequency range once used for trans-Atlantic radio broadcasts.—*News item.*

Research again has breached the dyke,
And we are all atwitter.
To think of muscles sending like
A radio transmitter!

Pray tell us also, probing man,
For nothing's past believing:
If muscles send out signals, can
They also be receiving?

If so, I'll make my deltoids dance,
And flex my biceps prettily,
And say hello to friends in France,
In England, and in Italy.

CONFIDENTIALLY

When circumstances place the doctor's wife in the position of being asked for confidential information about a patient, as at a social gathering, one of three courses of action is recommended: silence, tactful evasion, or feigned ignorance.—*From a panel discussion at the annual meeting of the American Academy of General Practice.*

When eager women put the screws
Upon a doctor's wife for news,
She must, with all her moral force,
Decide, and quick, upon her course.

She can, though it seems impolite,
Just shut her mouth up good and tight,
Or she can change the subject, or
Play dumb. And there is still one more,

Not mentioned, and perhaps the best,
Which I might modestly suggest:
She can, if she will just stop prying,
Say "I don't know," and not be lying.